Canadian
Geoscience
Council

Conseil
Geoscientifique
Canadien

Current research in the Geological Sciences in Canada
May 1983 - April 1984

Travaux en cours dans le domaine des sciences geologiques au Canada
mai 1983 à avril 1984

Canada

5-2264/

GEOLOGICAL SURVEY
PAPER 84-5

COMMISSION GÉOLOGIQUE
ÉTUDE 84-5

CANADIEN GEOSCIENCE COUNCIL
LE CONSEIL GÉOSCIENTIFIQUE CANADIEN

CURRENT RESEARCH IN THE GEOLOGICAL SCIENCES IN CANADA, MAY 1983 - APRIL 1984

TRAVAUX EN COURS DANS LE DOMAINE DES SCIENCES GÉOLOGIQUES AU CANADA, DE MAI 1983 À AVRIL 1984

Compiled by / Préparé par
THOMAS E. BOLTON

1984

© Minister of Supply and Services Canada 1984

Available in Canada through

authorized bookstore agents and other bookstores

or by mail from

Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, Canada K1A 0S9

and from

Geological Survey of Canada offices:

601 Booth Street
Ottawa, Canada K1A 0E8

3303-33rd Street N.W.,
Calgary, Alberta T2L 2A7

100 West Pender Street
Vancouver, British Columbia V6B 1R8
(mainly B.C. and Yukon)

A deposit copy of this publication is also available
for reference in public libraries across Canada

Cat. No. M44-84/5 Canada: $4.00
ISBN 0-660-52907-6 Other countries: $4.80

Price subject to change without notice

CONTENTS/TABLE DES MATIERES

INTRODUCTION

1 AREAL MAPPING, 1:50 000 OR MORE DETAILED/
CARTOGRAPHIE, 1:50 000 OU À PLUS GRANDE ÉCHELLE
1 Alberta/Alberta
1 British Columbia/Colombie-Britannique
2 Manitoba/Manitoba
2 New Brunswick/Nouveau-Brunswick
2 Newfoundland/Labrador/Terre-Neuve/Labrador
2 Northwest Territories/Territoires du Nord-Ouest
2 Nova Scotia/Nouvelle-Écosse
3 Ontario/Ontario
3 Québec
4 Saskatchewan/Saskatchewan
4 Yukon Territory/Territoire du Yukon

4 AREAL MAPPING, LESS DETAILED THAN 1:50 000/
CARTOGRAPHIE, À PLUS PETITE ÉCHELLE QU'AU 1:50 000
4 Alberta/Alberta
5 British Columbia/Colombie-Britannique
5 Newfoundland/Labrador/Terre-Neuve/Labrador
6 Northwest Territories/Territoires du Nord-Ouest
7 Ontario/Ontario
7 Québec
7 Saskatchewan/Saskatchewan
7 Yukon Territory/Territoire du Yukon

7 ENVIRONMENTAL GEOSCIENCE/SCIENCES DE LA TERRE
APPLIQUÉES A L'ENVIRONNEMENT

9 GEOCHEMISTRY/GÉOCHIME
9 Analytical methods and analysis/Méthodes analytiques et analyses
9 Exploration, organic/Appliquée, organique
9 Exploration, non-organic/Appliquée, non-organique
12 General/Généralités

14 GEOCHRONOLOGY/GÉOCHRONOLOGIE

16 GEOLOGICAL COMPUTER APPLICATIONS/APPLICATIONS
DE L'INFORMATIQUE À LA GÉOLOGIQUE

16 GEOMATHEMATICS/MATHÉMATIQUE DE LA TERRE

16 GEOMORPHOLOGY/GÉOMORPHOLOGIE

17 GEOPHYSICS/GÉOPHYSIQUE
17 Electrical/Méthodes électriques
18 Exploration/Prospection
18 Geomagnetism-paleomagnetism/Géomagnetisme-paléomagnétisme
19 Geothermal/Géothermique
19 Gravity/Gravité
20 Seismology and physics of interior/Sismologie et
et physique de l'intérieur de la terre
20 Other/Autre

21 GEOTECHNIQUE/GÉOTECHNIQUE
21 Engineering geology/Géologie de l'ingénieur
22 Geothermal/Géothermique
22 Permafrost/Pergélisol
23 Rock mechanics/Mécanique des roches
24 Soil mechanics/Mécanique des soils
24 Snow and ice/Neige et glace

25 GLACIOLOGY/GLACIOLOGIE

25 HYDROGEOLOGY/HYDROGÉOLOGIE

27 MARINE GEOSCIENCE/OCÉANOGRAPHIE

28 MINERAL/ENERGY GEOSCIENCE/SCIENCES DE LA TERRE APPLIQUÉES AUX MINÉRAUX ET A L'ÉNERGIE
28 Coal geology/Géologie du charbon
29 Industrial minerals/Substances minérales industrielles
30 Mineral deposition exploration/evaluation/Recherche et évaluation des gîtes de minéraux
33 Petroleum exploration/evaluation/Recherche et évaluation des gîtes de pétrole
34 General/Généralités

36 MINERALOGY/CRYSTALLOGRAPHY/ MINÉRALOGIE/CRISTALLOGRAPHIE

39 PALEONTOLOGY/PALÉONTOLOGIE
39 Invertebrate/Invertébrés
41 Vertebrate/Vertébrés
42 Paleobotany/palynology/Paléobotanique et analyse pollinique

45 PETROLOGY/PÉTROLOGIE
45 Experimental/Expérimental
45 Igneous/Roches ignées
47 Metamorphic/Roches métamorphiques
48 Sedimentary/Roches sédimentaires
48 General/Généralités

49 QUATERNARY GEOLOGY/GÉOLOGIE DU QUATERNAIRE

53 REMOTE SENSING/TELÉDETECTION

54 SEDIMENTOLOGY/SÉDIMENTOLOGIE
54 Ancient sediments/Sédiments anciens
56 Recent and unconsolidated sediments/Sédiments récents et non consolidés

58 SOIL SCIENCE/PÉDOLOGIE

59 STRATIGRAPHY/STRATIGRAPHIE
59 Precambrian/Précambrien
60 Paleozoic/Paléozoique
61 Mesozoic/Mésozoique
61 Cenozoic/Cénozoique

62 STRUCTURAL GEOLOGY/TECTONICS/GÉOLOGIE STRUCTURALE/TECTONIQUE
62 Alberta/Alberta
62 British Columbia/Colombie-Britannique
63 New Brunswick/Nouveau-Brunswick
64 Newfoundland/Labrador/Terre-Neuve/Labrador
64 Northwest Territories/Territoires du Nord-Ouest
64 Nova Scotia/Nouvelle-Écosse
65 Ontario/Ontario
65 Québec
65 Yukon Territory/Territoire du Yukon
65 General/Généralités

66 VOLCANOLOGY/VOLCANOLOGIE

68 ORGANIZATIONS REPORTING/ÉTABLISSEMENTS DÉCLARANTS

69 LIST OF GRANT AWARDS IN THE EARTH SCIENCES FOR 1983-84/LISTE DES SUBVENTIONS ATTRIBUÉES AUX SCIENCES DE LA TERRE EN 1983-84

87 RESEARCHER INDEX/INDEX DES CHERCHEURS

INTRODUCTION

The present publication recording research in progress in Canada from May 1983 to April 1984 is the result of a survey conducted between January, 1984 and March, 1984.

The research projects listed in this compilation are being undertaken mainly within federal and provincial departments, and universities. Data on industrial research was not received. A relatively complete overview of scientific research activities within Canada in the geological and allied sciences, however, is provided for the survey period.

Using the data supplied for this compilation by the respondees, some indication as to the lines of research receiving the greatest and least attention can be formulated. At least 387 research projects have not been previously reported. The greatest increase during the 1983-84 period was in the fields of Mineral/Energy Geoscience (51), Geochemistry (34) and Petrology (33). Research projects undertaken as graduate thesis in the universities are so specified wherever possible.

Additional details on research in the earth and related sciences underway in Canada during 1983 can be obtained through the annual reports prepared by individual university departments, research councils, and museums. Comprehensive reports on geophysical research and development, including volcanology and oceanography related research, are contained within the Canadian Geophysical Bulletin published by the Earth Physics Branch of the Department of Energy, Mines and Resources. Summaries of progress and short research reports related to hydrology/water-related environmental research and glaciology are provided annually by the Water Resources Branch of the Department of Environment Canada and the Associate Committee on Hydrology, National Research Council. Quaternary research in Québec is reviewed annually in the "Bulletin d'information de l'Association québecoise pour l'étude de Quaternaire".

Again this year a listing is included of the 1983 awards provided for geological research within the Research Agreements programs of the Departments of Energy, Mines and Resources, Environment Canada, and Indian and Northern Affairs Canada. The Natural Sciences and Engineering Research Council Canada also provided a computer print-out of the operating grants actually awarded in 1983. The 1983 Ontario Research Grants and Polar Continental Shelf Project field support to non-governmental activities are also listed.

Use of the compilation

The projects are grouped under main headings that cover the majority of disciplines within the geological and allied sciences. These groupings are unchanged from last years compilation (Geological Survey of Canada, Paper 83-5, 1983).

A complete list of organizations contributing to the present survey is included. Acknowledgment is made in particular to those who assembled and forwarded the data on research projects underway in the organizations under their direction. As a convenience, an alphabetically arranged index lists each investigator and the reference number(s) of his project(s).

INTRODUCTION

La présente publication, qui fait état de la recherche réalisée au Canada de mai 1983 à avril 1984, est le fruit d'une enquête effectuée entre Janvier 1984 et mars 1984.

Les projets de recherche enumérés sont exécutés surtout par des ministères fédéraux et provinciaux, et par des universités. Les données sur la recherche industrielle n'ont pas été reçues. Un aperçu assez complet de l'activité de recherche scientifique au Canada pour la periode visée dans le domaine de la géologie et des sciences connexes est cependant fourni.

À partir des renseignements donnés par les participants à l'enquête, il est possible de voir quels genres de recherche retiennent le plus et le moins l'attention. Au moins 387 projets nous ont été signalés pour la première fois. Les domaines où la recherche s'est le plus accrue durant l'année 1983-1984 sont les sciences de la Terre-Énergie/Minéraux (51), la géochime (34), et la Pétrologie (33). Les projets de recherche de 2e cycle, dans les universités, sont également précisés, dans la mesure du possible.

On peut se procurer de plus amples détails sur la recherche réalisée en 1983 au Canada dans le domaine des sciences de la Terre et des sciences connexes en consultant les rapports annuels mis au point par les différents départements l'universités, conseils de recherche et musées. Le volume du Canadian Geophysical Bulletin, publié par la Direction de la physique du Globe du ministère de l'Énergie, des Mines et des Ressources, comprend des rapports complets sur les travaux de recherche et les dernières réalisations en géophysique, y compris la recherche connexe en volcanologie et en océanographie. Des résumés des progrès réalisés et de brefs rapports ayant trait à la glaciologie et à la recherche environnementale liée à l'hydrologie sont publiés annueullement par la Direction des ressources en eau d'Environnement Canada et par le Comité associé de l'hydrologie, du Conseil national de recherches du Canada. La recherche sur le Quaternaire au Québec est signalée anneullement dans le "Bulletin d'information de l'Association québecoise pour l'étude du Quaternaire".

Nous incluons à nouveau cette année une liste des prix décernés en 1983 pour la recherche géologique dans le cadre des programmes d'accords de recherches des ministères de l'Énergie, des Mines et des Ressources, de l'Environnement, et de les Affaires Indiennes et du Nord. Le Consiel de recherches en sciences naturelles et en génie du Canada a également fourni un imprimé d'ordinateur détaillant les subventions aux travaux réellement accordées en 1983. On a signalé également dans ce rapport les subventions de recherche de la Commission Géologique de l'Ontario (Ontario Research Grants) et l'aide de l'Étude du plateau continental polaire en faveur d'activités non gouvernementales pour 1983.

Présentation

Les projets sont groupés sous des titres généraux s'appliquant à la majorite des disciplines que comprennent la géologie et les sciences connexes. Ces catégories sont les mêmes que l'année dernière (Étude 83-5, Commission géologique du Canada, 1983).

Une liste complète des organismes qui ont contribué à l'enquête a été dressée. Nous tenons à remercier particulièrement les personnes qui ont recueilli et envoyé les données concernant les projets de recherche en cours dans les organismes dont elles sont responsables. Pour vous faciliter la consultation, un répertoire alphabétique donne les noms de tous les enquêteurs et le(s) numero(s) de reférence de son(ses) projets(s).

ALBERTA/ALBERTA

1. HOWITT, R.W., Alberta Research Council (Soils):
   Soil survey _ County of Beaver, 1978-85.

   To provide soils information and interpretations to facilitate regional planning decisions. Mapping is complete and the photo mosiac maps have been compiled and drafted and are in the final stages of editing. The report is in the final stages of preparation prior to review and editing.

2. MacMILLAN, R.A., Alberta Research Council (Soils):
   Soil survey – Calgary area, Alberta, 1977-85.

   To provide soils information and interpretations to facilitate planning decisions related to urban development and argicultural land use. The report and maps are in the final stages of editing.

3. OLLERENSHAW, N.C., Geol. Surv. Can.:
   Geology of the southern Alberta Foothills, Highwood River to Athabasca River, 1970-.

BRITISH COLUMBIA/ COLOMBIE-BRITANNIQUE

4. ALLDRICK, D.J., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
   Salmon River project (NTS 104B/1), British Columbia, 1982-84.

   See:

   Geologic setting of the precious metal deposits in the Stewart area (104B/1); British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 149-164, 1984.

   Volcanic rocks of the Salmon River valley host the many gold-silver±base metal deposits of the Stewart mining camp. The volcanic rocks are part of the Lower to Middle Jurassic Hazelton Group. In the study area the volcanic package is a subaerial, differentiated calc-alkaline sequence. Studies have shown contrasting proximal and distal volcanic facies. Cross-cutting intrusive plugs or volcanic necks have composition and textures similar to some of the andesitic flows.

   To the east the volcanic strata is overlain by a Middle Jurassic thin-bedded clastic sedimentary sequence. The volcanic belt is bordered on the west by intrusive batholiths and stocks of the Coast Plutonic Complex. Some of these intrusive bodies post-date the country rock volcanic rocks, but age dates show that at least one pluton may be coeval with the volcanic strata. Complex alteration overprinted on the volcaniclastic rocks may be a product either of later regional metamorphism or metasomatism contemporaneous with the volcanism.

   Continuing studies will investigate: (1) detailed structure and stratigraphy of this Jurassic volcanic area; (2) petrology and geochemistry of fresh and altered strata; and (3) geochronology of the intrusive rocks.

5. DODDS, C.J., Geol. Surv. Can.:
   Geology of Skagway (104M) map-area, British Columbia, 1982-.

6. FRIEDMAN, R., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
   Origin and age of deformation of metamorphic rocks east of the Yalakom Fault and regional plutonic patterns in the intermontane belt between 51° and 54° North, British Columbia, 1983-86; Ph.D. thesis (Friedman).

   Metamorphic rocks east of the Yalakom fault will be initially mapped in a reconnaissance manner. These rocks occur in a northwest trending belt in the Aitkin Lakes, Mt. Waddington, and Anahim Lakes map-areas. Lithologies and internal structures in these metamorphic rocks will be mapped as well as their relationship with surrounding rocks. Samples for isotopic and petrographic study will be gathered. Samples will also be gathered from plutonic rocks in the Intermontane Belt between 51° and 54° North and west of 122° West, for U-Pb, Rb-Sr and K-Ar dating. Special attention will be paid to plutons in the Prince George and Nechako River map-areas which are as yet undated. The combined regional, plutonic, geochronologic study and more localized mapping and dating of metamorphic rocks will increase and dating of metamorphic rocks will increase the understanding of this poorly exposed area.

7. GETSINGER, J.S., GREENWOOD, H.J., ROSS, J.V., MCTAGGART, K.C., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
   Metamorphism and structure of Three Ladies Mountain area, Quesnel Highland (Cariboo Mountains), British Columbia, 1979-84; PH.D. thesis (Getsinger).

   Presentations of research results and ideas in 1983 included a talk on structure and tectonics of Three Ladies Mountain area at the Cordilleran Workshop held at U.B.C. in February, and at the Cordilleran Section meeting of the Geological Society of America in Salt Lake City in May; and a talk on metamorphic history at the Geological Association of Canada annual meeting in Victoria, B.C., in May.

   During summer 1983, laboratory work was completed for U-Pb zircon dating and Rb-Sr whole rock dating of metamorphosed intrusive rocks and sediments of the Snowshoe Formation. Snowshoe Formation was deposited about 750 Ma, and intruded by quartz dioritic sills about 500 Ma. Late to post-metamorphic pegmatites cooled through 400°C around 86 Ma. This section of the thesis is written, and has been revieved by supervisors.

   In fall 1983, electron microprobe analyses were begun on pelitic assemblages in order to investigate the applicability of geothermometry and geobarometry to the metamorphic rocks. Preliminary limits on pressure and temperature of peak metamorphism, determined from mineral assemblages and pre-existing phase diagrams, are 4 to 6 kb and 500-600°C. Current microprobe work is expected to narrow these limits.

   As part of the thesis, the geologic and structural map will be produced in GSC Open File Map format with the cooperation of the GSC in Vancouver.

8. KAPLAN, J.E., GREENWOOD, H.J., Univ. British Columbia (Geological Sciences):
   A section across Campbell's enigmatic line between Niagara and Blue Lead creeks, Cariboo Mountains, British Columbia, 1983-84; M.Sc. thesis (Kaplan).

   Primary field data was collected during the summer of 1983. The detailed structural map and the rock specimens collected are presently being evaluated. Work includes: 1) structural analysis; 2) the unraveling of phase relations using data derived from petrography and microprobe analysis; 3) isograd analysis; 4) determination of the timing of deformation and metamorphism; and 5) geothermometry.

9. MacINTYRE, D.G., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
   Geology of Alsek-Tatshenshini rivers map-area and Windy-Craggy deposit, British Columbia, 1982-84.

   See:

   Geology of the Alsek-Tatshenshini Rivers area; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 173-184, 1984.

   Geological studies of the Falconbridge Nickel Mines Limited – Geddes Resources Limited Windy-Craggy deposit began in 1982. An additional 10 days were spent mapping in the vicinity of the deposit during the 1983 field season. A total of 86 geologic stations were established in the map-area, which covered approximately 300 square kilometres. The primary purposes of this project were to define the stratigraphic and structural setting of the Windy-Craggy deposit and to assess the mineral resource potential of the surrounding area.

10. McMECHAN, M.E., Geol. Surv. Can.:
    Detailed geological study of selected areas within the Foothills and Rocky Mountain Belts between Peace River and Smoky River with emphasis on structure, British Columbia and Alberta, 1981-.

11. PARKINSON, D.L., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
    Regional geology and geochronology of the southern Okanagan Valley, near Oliver, British Columbia, 1982-84; M.Sc. thesis (Parkinson).

    Field work for this project was largely completed in the summer of 1983. The boundary between the Intermontane and Omenica Crystalline Belt in the southern Okanagan is an Eocene low angle denudation fault and is directly correlatable to the western boundary of the Okanogan Dome of Cheney (1980) in north-central Washington; the Oliver pluton, once thought to intrude this boundary, is entirely in the upper plate.

    Preliminary Rb-Sr and whole rock data have been generated and the U-Pb work is in rock preparation stage. This data will provide time calibration for polyepisodic deformational history of the metamorphic core complex, and petrologic and chemical analysis of the intermingled S- and I-type granitic rocks which are different phases of the Oliver pluton.

12. PRICE, R.A., Geol. Surv. Can.:
    Operation Bow-Athabasca, British Columbia and Alberta, 1965-.

13. RAY, G.E., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
    Carolin Mine – Coquihalla gold belt project, British Columbia, 1981-84.

    See:

    Coquihalla gold belt project; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, 1983.

    Geological mapping of the Coquihalla serpentinite and gold belts, and the associated Hozameen fracture system. Detailed structural and geochemical studies are concentrated on areas containing gold mineralization, including the Carolin mine deposit. The project should determine the controls of the gold mineralization and outline further areas for gold exploration.

14. RAY, G.E., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
    Harrison Lake project, British Columbia, 1982-84.

    See:

    The Nagy gold occurrences, Doctors Point, Harrison Lake; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1983-1, 1983.

    Geological mapping, whole rock and trace element analyses, together with petrographic studies of various gold occurrences located

along the Harrison Lake fracture system. Studies are concentrated on the Au-Ag-Bi vein mineralization at Doctors Point, the Pb-Zn-Ag-Au mineralization at the disused Providence mine, and the Au-pyrite-pyrrhotite-bearing quartz veins at the disused RN mine. This overview study of the Harrison Lake fracture system, with its associated hot spring activity and gold occurrences, could outline areas of potential epithermal and vein-type gold mineralization.

15. TEMPELMAN-KLUIT, D.J., Geol. Surv. Can.:
Penticton map area 82E, British Columbia, 1983-.

16. WOODSWORTH, G.J., Geol. Surv. Can.:
Eastern margin of the Coast Plutonic Complex, British Columbia, 1980-.

See:

Uranium-lead dates from the Central Gneiss Complex and Exstall pluton, Prince Rupert map area, British Columbia; Can. J. Earth Sci., vol. 20, no. 9, p. 1475-1483.

MANITOBA/MANITOBA

17. BAILES, A.H., SYME, E.C., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Flin Flon-White Lake project, Manitoba, 1979-85.

To provide a sound geological base for future exploration for massive sulphide base metal deposits. To that end, 1:15 840 scale mapping (published at 1:20 000) and detailed examination of volcanological features was undertaken in an area of approximately 200 km^2 around the town of Flin Flon, Manitoba. Whole-rock geochemistry of about 240 samples has been carried out in conjunction with the stratigraphic mapping. An open file report will be available in the spring of 1985, with a final report and papers to follow.

18. HERD, R.K., Geol. Surv. Can.:
Geology of the Island Lake map-area (53E), Manitoba and Ontario, 1976-.

19. ZWANZIG, H.V., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Kisseynew project, Manitoba, 1983-89.

A mapping program on the south flank of the Kisseynew Sedimentary Gneiss Complex will provide stratigraphic and structural control for the base and precious metal deposits in the Kisseynew Lake – Sherridon – Batty Lake region, north of the Flin Flon Greenstone Belt. The 1:50 000 scale and local 1:20 000 scale mapping is focussed on the metasedimentary and metavolcanic rocks of the Nokomis and Sherridon Groups.

During 1983 a preliminary structural interpretation was provided for the Lobstick Narrows area and new units were defined for the continental sediments and subaerial volcanic rocks of the Sherridon Group.

NEW BRUNSWICK/NOUVEAU-BRUNSWICK

20. SEAMAN, A.A., BARNETT, D.E., New Brunswick Dept. Nat. Res., (Mineral Resources Div.):
Surficial geology and granular aggregate resources of the Nepisiguit Lakes (21O/7) map-area, New Brunswick, 1983-84.

Field mapping and sampling of surficial deposits was carried out in the Nepisiguit Lakes map-area of New Brunswick. The aim of this project was to provide basic information pertaining to the location and extent of surficial geologic units in the area, with particular emphasis on the quality and quantity of material available from those units with aggregate potential. Regional sampling of basal tills was also undertaken to provide basic lithological, textural and geochemical data.

NEWFOUNDLAND/LABRADOR/ TERRE-NEUVE/LABRADOR

21. BLACKWOOD, R.F., Newfoundland Dept. Mines and Energy:
Geological mapping of the Dolland Brook (11P/15) area, Newfoundland, 1983-84.

The Bay du Nord Group consists of Ordovician turbidites and felsic volcanic rocks. During the Acadian Orogeny large scale recubent F_1 folds developed, overturned to the south. Metamorphism ranged from the greenschist to the upper amphibolite facies, culminating in a zone of migmatite and synkinematic granites. D_1 shear zones developed at this time, possibly in association with the recumbent folding. This was followed by a period of F_2 upright folding and two-mica granite intrusion. This later granite has potential for Sn-W-U mineralization.

22. COLMAN-SADD, S.P., Newfoundland Dept. Mines and Energy:
Geologic mapping, Cold Spring Pond/Bay D'Espoir, Newfoundland, 1974-88.

Mapping at 1:50,000 scale completed for Gaultois (1M/12), St. Albans (1M/13), Twillick Brook (2D/4), Burnt Hill (2D/5), Miguels Lake (2D/12), Cold Spring Poind (12A/1), Part of West Gander Rivers (2D/11).

23. HERD, R.K., Geol. Surv. Can.:
Geology of Red Indian Lake, west-half, Newfoundland, 1977-83.

NORTHWEST TERRITORIES/ TERRITOIRES DU NORD-OUEST

24. EADE, K.E., Geol. Surv. Can.:
Geology of the Tulemalu Lake map-area, District of Keewatin, 1975-.

25. HENDERSON, J.B., Geol. Surv. Can.:
Yellowknife and Hearne Lake map-areas, District of Mackenzie, 1970-.

See:

Interpretation of a gravity profile over a contact zone between an Archean granodiorite and the Yellowknife Supergroup using an interactive computer program with partial automatic optimization; Geol. Surv. Can., Paper 83-1B, p. 189-194, 1983.

26. HENDERSON, J.B., Geol. Surv. Can.:
Keskarrah Bay map-area, District of Mackenzie, 1976-.

27. HOFFMAN, P.F., Geol. Surv. Can.:
East arm of Great Slave Lake, District of Mackenzie, 1966-.

28. JAMES, D.T., DIXON, J.M., HENDERSON, J.B., Queen's Univ. (Geological Sciences):
The nature and significance of the Thelon Front tectonic zone in the Moraine Lake area, Northwest Territories, 1983-87; Ph.D. thesis (James).

The Thelon Front, the boundary between the Slave and Churchill structural provinces of the Canadian Shield, is known only from geologic mapping at 1:250,000 scale or less. This project will involve a more detailed examination of similarities and differences between the two provinces. The boundary region can be traced from the NWT-Alberta border, across the MacDonald and Bathurst faults, to the Arctic coast. It is marked by regionally persistent but varied geological characteristics. A portion of this tectonic zone will be studied in the Moraine Lake area (64°N, 106°W). In this region the boundary has been placed along the western edge of a straight zone of mylonitized rocks, which is coincident with major geophysical features that are part of the 850 km long tectonic zone. To: 1) examine in detail the geology on either side of the straight zone; 2) search for kinematic indicators in the mylonites; 3) explain the time relationships between Archean and Proterozoic metamorphisms and the mylonitization; and 4) discuss the significance of the Thelon Front tectonic zone.

29. LAPORTE, P.J., Indian and Northern Affairs Canada (Geol. Div.):
The geology of the Sissons Lake area, Northwest Territories, 1981-84.

Data and samples for petrographic anlaysis have been collected from the area extending north from Princess Mary Lake to Schultz Lake. A map at 1:50 000 will be published in April, 1984 covering NTS areas 66A/3(W½), 4, 5, 6(W½) and 11(W½). Subsequent work, to the east, will be undertaken in 1984-85. Accent of the study has been on determining the structure and stratigraphy of a volcano-sedimentary assemblage enclosing Urangesellschaft Canada Ltd. Lone Gull uranium deposit.

30. MORROW, D.W., Geol. Surv. Can.:
Southwestern Ellesmere – western Devon Islands (Operation Grinnell), District of Franklin, 1967-.

31. TAYLOR, F.C., Geol. Surv. Can.:
Geology of Whitehills Lake, District of Keewatin, 1980-.

32. TELLA, S., Geol. Surv. Can.:
Geology of Amer Lake map-area, District of Keewatin, 1976-82.

33. THORSTEINSSON, R., Geol. Surv. Can.:
Cornwallis and adjacent smaller islands, District of Franklin, 1965-.

34. YEO, G.M., PADGHAM, W.A., JACKSON, V. Indian and Northern Affairs Canada (Geol. Div.):

Geology of Quyta Lake area (NTS 85J/9 and 3/16), Northwest Territories, 1983-84.

See:

Preliminary geological compilation of Quyta Lake area, NWT (parts of NTS 85J/9 and 3/16) 1:50 000; Indian and Northern Affairs Canada, EGS 1983-7.

We plan to complete mapping in this area, the last major part of the Yellowknife Greenstone Belt not revised since the late 1930's, in the 1984 field season. This work should resolve (hopefully) the relationship between the Clan Lake Volcanic Complex and the main part of the Yellowknife Belt.

35. YEO, G.M., PADGHAM, W.A., JACKSON, V., RELF, C., Indian and Northern Affairs Canada (Geol. Div.):
Geology of western Hepburn Island area (NTS 76M/west), Northwest Territories, 1983-84.

See:

Preliminary geological compilation of western Hepburn Island area, NWT (NTS 76M/west) 1:125,000; Indian and Northern Affairs Canada, EGS 198-6

We plan to finish up regional mapping in this area during the 1984 field season.

NOVA SCOTIA/NOUVELLE-ÉCOSSE

36. MOORE, R.G., FERGUSON, S.A., Acadia Univ. (Geology):
Wolfville project, Nova Scotia, 1980-84.

See:

Geological map of the Hantsport area; Nova Scotia Dept. Mines and Energy, Map 83-1, 1983.

37. RAESIDE, R.P., BARR, S.M., Acadia Univ. (Geology):
Cape Breton Highlands mapping project, Nova Scotia, 1983-87.

See:

Deformation, metamorphism and plutonism in the Ingonish River area, Cape Breton Island, Nova Scotia; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 98, 1984.

The main mass of the Cape Breton Highlands comprises a series of rocks variously described as undifferentiated gneiss and schist of basement complex and/or George River Group, undifferentiated metamorphic rocks, and composite gneiss. A number of studies have been made of peripheral areas of the Highlands and a wide variety of rocks have been recognized. Field work in the east-central Highlands in 1983 confirmed that at least two phases of metamorphism and deformation have occurred, together with continued granitoid plutonism from late Hadrynian to Mississippian.

To produce a detailed geological map of the Cape Breton Highlands, correlate the deformation, metamorphism and igneous activity, and provide a picture of the crustal development from late Precambrian to Mississippian time of this relatively isolated, but critically situated block of the Appalachian Orogen.

ONTARIO/ONTARIO

38. EASTON, R.M., DRESSLER, B.O., Ontario Geol. Surv.:
Howland area, Grenville Province, Ontario, 1983-88.

See:

Howland area: Haliburton, Peterborough and Victoria Counties; Ontario Geol. Surv., Misc. Paper 116, p. 74-79, 1983.

Detailed mapping in Minden 1:50,000 scale topographic sheet. Area incompletely mapped prior to this study. Map area straddles Central Metasedimentary Belt – Gneiss Belt boundary of the Grenville Province. Mapping to date indicates prevenue of large thrust sheets in area, and increasing deformation towards Gneiss Belt boundary. Boundary zone is an area of major tectonic disruption and may be late in history of the map area.

39. JACKSON, M.C., THURSTON, P.C., Ontario Geol. Surv.:
Geology of the Lumby Lake area, western half (1982-83), eastern half (1983-84), Ontario, 1982-84.

40. MASSEY, N.W.D., Ontario Geol. Surv.:
The Precambrian geology of the Mishewawa Lake area, District of Algoma, Ontario, 1982-84.

The Mishewawa Lake area covers an area of about 530 km^2 to the south and west of the Town of Wawa. The area covers the southern margin of the Wawa Supracrustal Belt. Mafic-to-intermediate metavolcanics of Archean age are interbedded with lesser amounts of intermediate-to-felsic metavolcanics and minor iron formations, and are overlain by clastic metasediments with interbedded felsic metavolcanics. Three cycles of supracrustal rocks have been recognized, with a tendency for the sequence to young to the northwest. Several mafic bodies intrude the supracrustals, including several conformable sills. Felsic stocks and plutons intrude the sequence both internally and externally. A heterogereous granodiorite – mafic metavolcanic zone marks the margin of the Supracrustal Belt. Deformation during the Kenoran Orogeny probably started during the second cycle of volcanism and included the development of strike-faulting at the major foliation. Three major folds developed in the area as deformation proceeded. A late-stage brittle deformation resulted in large northwest trending faults with sinistral offsets. These were probably reactivated during the Keweenawan rifting event. Diabase and alkaline dykes of Keweenawan age cut the Archean lithologies.

41. ROWELL, N.F., Ontario Geol. Surv.:
Black River Matheson project, Ontario, 1982-86.

Detailed geology of the Black River Matheson area Abitibi Belt, Ontario. Approximately one half the area has not been mapped and petrographic studies and manipulation of chemical data are in progress. Reevaluation of Beatty Township indicates substantial amounts of komatiitic-affinity flows are present that were previously noted as tholentic basalts. Apparently tightly folded areas without any observable penetrative deformation will require study as to structural style of the area.

QUÉBEC

42. BÉLANGER, M., CIMON, J., CLARK, T., PILLET, D., Québec Ministère Énergie et Ressources:
La région du Lac Brisson, Québec, 1983-84.

Reconnaissance geologique et evaluation du potentiel minéral à l'est de la fosse du labrador. Emphase sur la metallogénie de certains secteurs.

43. CARON, A., BIRON, S., ST-JULIEN, P., Québec Ministère Énergie et Ressources:
Schistes de Bennett, Québec, 1982-84.

Voir:

Région de Warwick (NE); Québec Ministère Énergie et Ressources, DP 83-21, 1984.

Région d'Arthabasca (SE); ibid., DP 83-07, 1984.

44. CHARBONNEAU, J-M., DUPUIS-HÉBERT, L., PICARD, C., CHARTRAND, F., Québec Ministère Énergie et Ressources:
Chapais-Branssat, Québec, 1980-84.

Voir:

Géologie de la région du lac Thomelet; Québec Ministère Énergie et Ressources, ET 83-09, 1984.

Géologie de la région du lac Inconnu, Abitibi Est, Québec; ibid., ET 83-16, 1984.

Géologie de la demie nord du canton de Daubrée; ibid., ET 83-06, 1984.

En cours: réaction d'un rapport final pour tout le project CHAPAIS-BRANSSAT.

45. COUSINEAU, P., ST-JULIEN, P., BIRON, S., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Cambro-Ordovicien des régions de Saint-George-de Beauce et de lac Etchemin, 1982-83; thèse de doctorat (Cousineau).

Voir:

St-Joseph-de-Beauce; Québec Ministère Énergie et Ressources, DP 82-01, 1983.

46. DE BROUCKER, G., ST-JULIEN, P., BIRON, S., Univ. Laval (Géologie), Québec Ministère de l'Énergie et Ressources:
Stratigraphie et structure des groupe de Maquereau et de Mictaw, 1982-85; thèse de doctorat (De Broucker).

Voir:

Groupes de Mictaw et de Maquereau; Québec Ministère Énergie et Ressources, DP 83-06, 1984.

Levé principal terminé. Vérification et synthèse 1984-85.

47. deROMER, H.S., Québec Ministère Énergie et Ressources:
Geologie des Monts Stoke, Québec, 1980-85.

Voir:

Québec Ministère Énergie et Ressources, ET 82-02, 1983.

Compilation of the structure and stratigraphy of the Stoke Mountains, Québec.

48. DUBOIS, C., SKIDMORE, W.B., BRISEBOIS, D., Québec Ministère Énergie et Ressources:
Géologie de la région de Ruisseau Jérôme Est, Québec, 1983-84.

Étudier une coupe stratigraphique à travers le Dévonien du sud-ouest de la Gaspésie. Débuter la carte géologique au 1:20 000 de la région de Ruisseau Jérôme.

49. GAUTHIER, L., BÉDARD, J., SKIDMORE, W.B., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Anticlinorium d'Aroostook – Percé, Canton de Raudin et de Weir, Québec, 1983-84; M.Sc. (Gauthier).

Cartes géologiques, et analyses structurale d'une partie du groupe de Matapédia, Nord-Est de la Gaspésie.

50. GLOBENSKY, Y., Québec Ministère Énergie et Ressources:
Géologie de la région de Saint-Jean(N) et de Béloeil, Québec, 1983-84.

Refaire la carte géologique de ce secteur et publier un rapport géologique tenant compte des nouvelles données disponibles.

51. HÉBERT, Y., CIMON, J., IMREH, L., Québec Ministère Énergie et Ressources:
Géologie du Canton de Brongniart, Québec, 1983-84.

Connaître le contexte structural du canton de Brongniart couvert par la Formation d'Obatogamau.

52. LAMOTHE, D., CIMON, J., CLARK, T., Québec Ministère Énergie et Ressources:
Région du Lac Beauparlant, Fosse de l'Ungava, Québec, 1983-84.

Synthèse géologique de la ceinture Cap Smith. Étude gitologique et recommandations pour l'exploration minière.

53. MALO, M., BÉLAND, J., SKIDMORE, W.B., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Géologie de l'Anticlinorium Arrostook-Percé, Est de la Gaspésie, Québec, 1981-85; thèse de doctorat (Malo).

Levé principal terminé. Phase de vérification et synthèse 1984-85.

54. PETRYK, A.A., Québec Ministère Énergie et Ressources:
Géologie de l'Île d'Anticosti, Québec, 1975-85.

Progrès avancé sur l'étude détaillée de la lithostratigraphie de la région du stratotype proposé de la limite Ordovicien-Silurien pour l'IUGS; collections de coraux rugose de la zone de la limite. Quelques vérifications des contacts interformationnels et intermembres ont été réalisées à l'été 1983, surtout dans la moitié ouest d'Anticosti.

55. SHARMA, K.N.M., LAMOTHE, D., HÉBERT, Y., GIOVENAZZO, D., LAUZIÈRE, K., LACOSTE, P., Québec Ministère Énergie et Ressources:
Projet Capisisit – Desmaraisville, Québec, 1981-85.

Le projet se termine à l'été '84 avec la cartographie de certains secteurs dans les cantons de Lesueur et Letac. Un rapport final suivra. Trois rapports intermédiaires sont présentement à l'édition et paraîtront probablement aprés AVRIL '84.

56. VAN DER LEEDEN, J., BÉLANGER, M., CIMON, J., Québec Ministère Énergie et Ressources:
Région du Lac de la Hutte Sauvage, Québec, 1983-84.

Reconnaissance géologique et evaluation du potentiel minéral à l'est de la fosse du Labrador. Emphase sur la metallogénie de certains secteurs.

57. VEILLETTE, J.J., Geol. Surv. Can.:
Géolgoie du Quaternaire, région de l'Outaouais supérieur, Québec-Ontario, 1977-.

SASKATCHEWAN/SASKATCHEWAN

58. HARPER, C.T., MACDONALD, R., Saskatchewan Geol. Surv.:
Reconnaissance bedrock geology: Nevins-Forsyth Lakes area (Part of NTS 740), Saskatchewan, 1983.

See:

Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 5-15, 1984.

A 760 km² area centred 65 km east of Uranium City was mapped at 1:50,000 scale. The southeast striking Oldman-Bulyea Lakes Shear Zone (OBSZ) splits the area into two lithologically and metamorphically distinctive regions. The gneissic terrain south of OBSZ is characterized by feldspathic gneisses with minor pyribolite/amphibolite, iron formation, early metamorphosed mafic dykes, white pegmatite and numerous lamprophyre dykes. All pre-pegmatite rocks were metamorphosed to the granulite facies and become progressively retro-metamorphosed to the amphibolite facies towards the OBSZ. The region north of the OBSZ is characterized by amphibolite facies grade gneisses only. The dominant rocks are migmatitic quartzofeldspathic gneiss with biotite and/or hornblende, minor amphibolite and rare metapelitic gneiss. A zone of granite emplacement parallels the OBSZ and numerous smaller sheets and dykes of granite and pegmatite occur mainly north of the OBSZ. The OBSZ is marked by a broad zone of mylonite, mylonitic gneiss and augen gneiss. In the centre of the area the main shears break into numerous lesser splays, marked by more restricted cataclastic development. Structurally the two regions are similar, possessing complex fold interference patterns which vary from dome-and-basin to mushroom-shaped. Minerals of economic interest include sulphide and oxide facies iron-formation, radioactive pegmatites and lamprophyre dykes, thorium and rare earth element monozite showings, and traces of molybdenite and malachite.

59. MACDONALD, R., THOMAS, M., Saskatchewan Geol. Surv.:
Project Beaverlodge review geology, Saskatchewan, 1982-83.

See:

Geology and regional context of the Oldman Lake area; Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 19-23, 1984.

Review geology: Prince Lake area; ibid., p. 24-27, 1984.

1:20,000 scale geological mapping of various "Key" areas in the vicinity of Uranium City in conjunction with an Rb-Sr geochronology program (K. Bell, Carleton University) has been carried out. This data will be used as a background to compilation and re-interpretation of the geology of the Greater Beaverlodge area.

60. SCOTT, B.P. MACDONALD, R., Saskatchewan Geol. Surv.:
Reconnaissance bedrock geology: Oman Lake area (NTS 740-10), Saskatchewan, 1983-.

See:

Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 2-4, 1984.

A 800 km² area centred 120 km east of Uranium City was mapped at 1:50,000 scale. The area is characterized by migmatitic biotite and/or hornblende quartzofeldspathic gneisses with minor hornblende gneiss, diopside gneiss, metapelitic gneiss, granite sheets and late mafic dykes. Interlayers of metaquartzite and metaconglomerate occur within the quartzofeldspathic unit. Dome-and-basin and mushroom-shaped fold interference patterns are developed. The rocks only record amphibolite facies metamorphism. Several uraniferous pegmatites occur in the vicinity of Box Lake and molybendite is found in several islands in the western part of this lake.

61. SIBBALD, T.I.I., SCHWANN, P., Saskatchewan Geol. Surv.:
Project Beaverlodge metallogeny, Saskatchewan, 1982-85.

See:

Uranium-Gold metallogenic studies, Nicholson Bay ultramafic complex; Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 75-79, 1984.

1:20,000 scale mapping and mineral deposit and lithogeochemical investigations were continued in the Beaverlodge-Goldfields-Uranium City area. The ultramafic complex east of Nicholson Bay was mapped and sampled in detail (Schwann). The ultramafic rocks of the complex are chemically similar to komatiites though not distinctive morphologically. The geochemistry and alteration features of mineralogically complex uranium (gold) veins was investigated.

62. THOMAS, D.J., Saskatchewan Geol. Surv.:
Reconnaissance bedrock geology: Forsyth Lake (East) area NTS 74-0-11E, Saskatchewan, 1983-84.

See:

Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 16-18, 1984.

Geological mapping of the Forsyth Lake area (74-0-11E) was carried out at a scale of 1:50,000 in 1983. The area is underlain by hign grade gneisses of quartzofeldspathic, amphibolitic, dioritic and pelitic compositions. The gneisses are intruded by syn- to post-tectonic granitic sills and stocks as well as minor diabase and lamprophyre dykes. Four deformational episodes are recognized; resultant D_1 to D_3 events produced complex fold interference relations accompanied by penetrative fabrics, while D_4 is marked by late to post-orgenic faulting. Metamorphic data indicates attainment of granulite facies in the extreme southwest part of the area and middle to upper amphibolite facies conditions elsewhere. Radioactive pegmatite intruding pelitic assemblages were noted in the Bulyea Lake area.

YUKON TERRITORY/ TERRITOIRE DU YUKON

63. CAMPBELL, R.B., Geol. Surv. Can.:
Operation Mount St. Elias, Yukon-British Columbia, 1973-.

64. KALSSEN, R.W., Geol. Surv. Can.:
Surficial geology and terrain evaluation, southern Yukon, 1977-.

65. NORRIS, D.K., Geol. Surv. Can.:
Operation Porcupine, Yukon-District of Mackenzie, 1961-.

66. THOMPSON, R.I., Geol. Surv. Can.:
Stratigraphy and structure of Dawson, Larsen Creek and Narsh Creek map areas, Yukon Territory, 1980-.

AREAL MAPPING, LESS DETAILED THAN 1:50 000/CARTOGRAPHIE, À PLUS PETITE ÉCHELLE QU'AU 1:50 000

ALBERTA/ALBERTA

67. GODFREY, J.D., Alberta Research Council (Geol. Surv.):
Geology of Ryan-Fletcher Lakes District, northeastern Alberta, 1972-84.

See:

Geology of the Ryan-Fletcher Lakes District, Alberta; Alberta Research Council, Earth Sciences Rept. 84-2, 1984.

68. GODFREY, J.D., Alberta Research Council (Geol. Surv.):
Geology of Bocquene-Turtle Lakes District, northeastern Alberta, 1983-84.

Four maps in press. Report in preparation.

69. GODFREY, J.D., LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):
Geology of Myers-Daly Lakes, northeastern Alberta, 1973-84.

Drafting of four maps for publication 80% complete. Report in preparation.

70. GODFREY, J.D., LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):
Geology of Fitzgerald-Tulip-Mercredi-Charles Lakes District, northeastern Alberta, 1974-84.

71. TURCHENEK, L.W., Alberta Research Council (Soils):
Aspects of peatlands, Alberta, 1981-85.

The main objective of the peatlands program during 1983/84 was the development of a peatland inventory system for Alberta. Methodology consisted of review of inventory programs in other provinces and countries, and conducting a pilot inventory project in central Alberta. The pilot inventory consisted of three subprojects. In the first, reconnaissance level inventory by conventional airphoto interpretation and field truthing methods was examined. In the second, mapping by computer analysis of LANDSAT data, supported by limited field checking, was investigated. In the third subproject, detailed peatland inventory by means of intensive grid and transect sampling methodology was examined. Studies related to peatland mapping are continuing during 1984/85. In addition, investigations of soil temperatures in peatlands, of field and laboratory methods for characterizing peats, and of differences in organic soil properties in different parts of the province are being conducted.

**BRITISH COLUMBIA/
COLOMBIE-BRITANNIQUE**

72. FERRI, F.F., SIMONY, P.S., Univ. Calgary (Geology and Geophysics):
Geology of the Blackwater Range, British Columbia, 1982-84; M.Sc. thesis (Ferri).

See:

Geol. Surv. Can., Paper 84-1A, p. 87-90, 1984.

In the Blackwater Range in the western Rocky Mountains of British Columbia, Hadrynian to Cambrian strata are incorporated within the Porcupine Creek Anticlinorium. These rocks are composed of slates and clastics of the Miette and Gog groups, overlain by argillaceous limestones of the Chancellor Formation. Detailed mapping allowed a further subdivision of the lower and middle Chancellor Formation.

The Chancellor strata are structurally thickened above the more competent Gog strata within the core of the anticlinorium, and at the level of the Gog Group the anticlinorium narrows southeastward. These factors indicate that a detachment horizon at or above the Gog/Chancellor contact has accommodated the shortening and thickening of the Chancellor strata.

A penetrative, locally crenulated cleavage fans across the anticlinorium. Metamorphism is of lower greenschist grade and is pre- to syn-tectonic, though tectonism outlasted metamorphism.

73. GABRIELSE, H., Geol. Surv. Can.:
Operation Finlay, British Columbia, 1970-.

74. GABRIELSE, H., Geol. Surv. Can.:
Operation Dease, British Columbia, 1977-.

75. MONGER, J.W.H., Geol. Surv. Can.:
Geology of the Ashcroft and Hope map-areas, British Columbia, 1980-.

76. OKULITCH, A.V., Geol. Surv. Can.:
Kootenay River (NTS 82) map area, 1:1 million Geological Atlas Program, 1970-.

77. REESOR, J.E., Geol. Surv. Can.:
Geology of Nelson map area (E/2), British Columbia, 1979-.

78. RODDICK, J.A., Geol. Surv. Can.:
Coast Mountains project, British Columbia, 1963-.

See:

Geophysical review and composition of the Coast Plutonic Complex, south of latitude 55°N; Geol. Soc. Amer., Mem. 159, p. 195-211, 1983.

79. WHEELER, J.O., Geol. Surv. Can.:
Lardeau map-area, British Columbia, 1979-.

80. WOODSWORTH, G.J., Geol. Surv. Can.:
Kemano project, British Columbia, 1977-.

**NEWFOUNDLAND/LABRADOR/
TERRE-NEUVE/LABRADOR**

81. DICKSON, W.L., COLMAN-SADD, S.P., Geol. Surv. Can., Newfoundland Dept. Mines and Energy:
Geology and geochemistry of the North Bay Granite, southern Newfoundland, 1982-84.

See:

Geology of the D'Espoir Brok map area and part of the Facheux Bay map area, south-central Newfoundland; Geol. Surv. Can., Paper 83-1A, p. 283-290, 1983.

Geology of the Wolf Mountain (east half) map areas, south-central Newfoundland; Geol. Surv. Can., Paper 84-1A, p. 537-546, 1984.

Middle Ordovician metasedimentary rocks of the Baie d'Espoir Group outcrop along the northern and southern margins of the map area and consist of polydeformed and highly metamorphosed biotite-garnet psammites and semi-pelites with minor staurolite-bearing schist. Near the northern margin of the map area, an elongate belt of strongly deformed granitoids has intruded the Baie d'Espoir Group. The North Bay Granite, which has been radiometrically dated at 430 and 427 Ma, cuts all the other major units in the area. The North Bay Granite consists of four major rock types: medium grained, equigranular, biotite ± muscovite granodiorite; medium grained, porphyritic, biotite granite; medium grained, equigranular, biotite ± muscovite granite; and coarse grained, coarsely porphyrytic, biotite granite. All units of the North Bay Granite have been variably deformed during the later deformed events of the metasediments. The deformation of the metasediments and North Bay Granite is considered to be Acadian. The North Bay Granite has been intruded by a few massive diabase and microsyenite dykes. Four large quartz veins (one of which has been assessed at over 1.22×10^6t) have some potential as a source of silica. Significant W-Mo mineralization occurs within the North Bay Granite, in the Granite Lake area, in sericitized, porphyritic biotite-muscovite granite.

82. ERDMER, P., Geol. Surv. Can./Newfoundland Dept. Mines and Energy:
Reconnaissance investigations in the Precambrian terrane of the northern Long Range Mountains of Newfoundland, 1983-84.

See:

Summary of fieldwork in the northern Long Range Mountains, western Newfoundland; Geol. Surv. Can., Paper 84-1A, p. 521-530, 1984.

In preparation for mapping the Precambrian terrane of the northern Long Range Mountains of Newfoundland at 1:100 000 scale, two strips were mapped in 1983, along the western side of White Bay and along the Upper Humber River. The report presents a review of the tectonic nature of the terrane, followed by generalized geological maps and descriptions of the major rock units of the region. A Helikian or older quartzo-feldspathic basement gneiss complex, part of which is of sedimentary origin, has been intruded by a gabbro-anorthosite massif and by megacrystic granitic rocks of probable Neohelikian age. Metamorphic grade is generally in the amphibolite facies, with granulite grade rocks occurring locally. A retrograde greenschist event affected the entire eastern portion of the terrane.

83. ERMANOVICS, I.F., Geol. Surv. Can.:
Archean rocks of the Nain Provence in Hopedale (13N), Snegamook Lake (13K), and Makkovik (13O) map-areas, Labrador, 1978-.

See:

A summary of Rb-Sr isotope studies in the Archean Hopedale block and the adjacent Proterozoic Makkovik Subprovince, Labrador: report 5; Geol. Surv. Can., Paper 83-1B, p. 127-135, 1983.

84. GOWER, C.F., Newfoundland Dept. Mines and Energy:
The Grenville Province in eastern Labrador, 1980-.

See:

1:100 000 maps for Rigolet, Groswater Bay, English River, Sandwich Bay, Table Bay; Newfoundland Dept. Mines and Energy, Maps 83-42, 83-43, 83-44, 83-45, 83-46, 1983.

Geology of Double Mer White Hills and surrounding region, Grenville Province, eastern Labrador; Geol. Surv. Can., Paper 84-1A, p. 553-561, 1984.

The mineral potential of paragneiss in the Grenville Province in eastern Labrador; Newfoundland Dept. Mines and Energy, Report 84-1, p. 80-88, 1984.

Continued mapping in the Grenville Province of eastern Labrador has confirmed a bipartite division into two major terranes; the Groswater Bay Terrane and the Lake Melville Terrane. Within each of these terranes subsidiary subdivisions (Domains) have been identified. Literature research concerning the sveconorwegian orogenic belt in southern Sweden has demonstrated a remarable correlation between Labrador and Scandinavia. Terrane equivalents can be recognized between both areas; in each case possessing similar rock types, geological history and structural/metamorphic style.

Present work is focussing on gaining a clearer understanding of the metamorphic history. Presently evolving concepts suggest a high grade metamorphic history that may have affected the region continuously from at least as early as 1650 Ma and persisting until uplift during the Grenvillian orogeny. Preliminary quantative P-T estimates indicate that P total exceeded 10 kb and T at least 800°C.

85. NUNN, G.A.G., NOEL, N., CULSHAW, N.G., Geol. Surv. Can., Newfoundland Dept. Mines and Energy:
Geology of the Atikonak Lake area, Grenville Province, Newfoundland, 1982-84.

See:

Geology of the Atikonak Lake area, Grenville Province, western Labrador; Newfoundland Dept. Mines and Energy, Min. Devel. Div., Rept. 84-1, 1984.

A continuing program to determine the ages and tectonic history of rocks in the Grenville Province of western Labrador (see also Andy Thomas). 23A/northeast was mapped last summer (23H/southeast in 1982).

The main rock types are paragneisses at either upper amphibolite facies or granulite facies metamorphic grade. In the east paragneiss was intruded by gabbronoritic and then granitoid plutonic rocks and subsequently attained granulite grade during (the Labradorian) orogeny at ca. 1650 Ma. In the west paragneisses of both facies have undergone the same geological history as those in the east with the higher grade rocks thrust over those of lower grade late in the Labradorian. In the central, lowlying, largely drift covered parts of the map area, upper amphibolite facies paragneiss was also intruded by a gabbroid/granitoid plutonic suite and also by later gabbroic rocks (Shabogama Intrusive Suite). This region underwent peak metamorphism during the Grenville orogeny. The adjacent eastern and western areas (above) do not contain any significant metamorphic regrogression indicating that they are allochthonous thrust sheets emplaced after peak Grenvillian metamorphism. The northern tip of a large anorthosite massif occurs in the southeast. Its age and contact relationships are unknown. Dating of the unit is in progress.

86. NUNN, G.A.G., NOEL, N., CULSHAW, N.G., Newfoundland Dept. Mines and Energy:
Geology of the Atikonak Lake area, Grenville Province, Newfoundland, 1982-84.

87. O'BRIEN, S.J., Newfoundland Dept. Mines and Energy:
Geological mapping of the west-central Hermitage Flexure, Newfoundland Appalachians, 1982-85.

See:

Geology of the Peter Snout map area (east half), Newfoundland; Newfoundland Dept. Mines and Energy, Min. Devel. Div. Rept. 83-1, p. 57-67, 1983.

Geology of the White Bear River map area, Newfoundland; ibid., Rept. 84-1, 1984.

Approxiamtely 50% of mapping complete; regional mapping of Burgeo (11P/11) and the eastern half of Burnt Point (12A/2) to be completed during 1984.

88. RYAN, B., MARTINEAU, Y., BRIDGWATER, D., KORSTGAARD, J., NUTMAN, A., Newfoundland Dept. Mines and Energy:
Geology of the Saglek-Hebron area, Nain and Churchill Provinces, Newfoundland, 1982-85.

See:

The Archean-Proterozoic boundary in the Saglek Fiord area, Labrador: Report 1; Geol. Surv. Can., Paper 83-1A, p. 297-304, 1983.

The Archean-Proterozoic boundary in northern Labrador: Report 2; Geol. Surv. Can., Paper 84-1A, p. 545-551, 1984.

Field work for project is completed and four 1:50 000 NTS sheets have been mapped at sufficient scale for 1:100 000 publication. The winter of 1983-84 will be spent in final map compilation, data interpretation and report writing.

89. THOMAS, A., CULSHAW, N.G., WOOD, D., MANNARD, G., WHELAN, G., NUNN, G.A.G., Newfoundland Dept. Mines and Energy:
Geology of the Lac Ghyuelde-Lac Long area, Grenville Province, Labrador and Quebec, 1983-85.

Geology of the Winokapau Lake area, Grenville Province, central Labrador, 1982-85.

See:

Geology of the Winokapau Lake area, Grenville Province, central Labrador; Geol. Surv. Can., Paper 83-1A, p. 305-312, 1983.

Geology of the Lac Ghyuelde-Lac Long area, Grenville Province, Labrador and Quebec; Geol. Surv. Can., Paper 84-1A, p. 485-493, 1984.

A total of eight 1:50 000 NTS sheets have been mapped at 1:100 000 scale. Results of the projects so far are the production of 632 thin sections and 443 wholerock major and trace element bedrock geochemical samples, providing a regional scale data base for approximately 2900 square miles of central Labrador. Significant scientific findings are: 1) granulite grade gneisses in central Labrador previously thought to have formed during the Grenvillian orogeny, have a Proterozoic protolith which has undergone a now well documented major Palohelikian orogenic event dated by U-Pb and Rb-Sr methods at circa 1650 MA; 2) sapphirine/quartz assemblages occur in these granulite paragneisses regionally over an extremely large area; 3) amphibolite grade paragneisses associated with the granulite gneisse are chemical/compositional equivalents now correlated with the granulites; 4) a batholithic suite of calc-alkaline granitoids dated at circa 1600-1700 Ma is associated with the aformentioned Paleohelikian orogeny; and 5) Grenvillian tectono-metamorphic effects on the paleohelikian gneiss are effectively masked by a combination of overthrusting and tectonic dismemberment as well as the extremely dry conditions prevailing in the granulite gneiss terrane. U-Pb and Rb-Sr systems have not been reset and lower grade retrogressive metamorphic effects are scarce in the granulites.

90. WARDLE, R.J., Newfoundland Dept. Mines and Energy:
Geology of the North West River area, Newfoundland, 1983-84.

See:

Geology of the North West River area; Newfoundland Dept. Mines and Energy, Report 84-1, p. 53-67, 1984.

Work in future years will involve continued regional mapping to the south of the North West River area. The objective of this work will be to trace the southerly extent of the Cape Caribou River allocthon (allochthonous slice of gabbro and anorthosite) in the Grenville Province and to examine its relationships to the Mealy Mountains anorthosite-granite suite (1640 Ma).

A new subproject will also be started in the Kaipokok Bay area of the Makkovik Subprovince. This first year of work will involve reconnaissance examination of the reworked Archean basement, the Lower Aillik Group supracrustals and the upper Allik Group volcanics. It is hoped that this work will provide the basis for a comprehensive geochronology project in the area. It is also intended to set up detailed projects on the various aspects of U-Mo mineralization in the area.

91. WARDLE, R.J., RYAN, B., Newfoundland Dept. Mines and Energy:
Nain-Churchill Province cross-section, Newfoundland, 1982-84.

See:

Nain-Churchill Province cross-section, Nachuak Fiord, northern Labrador; Newfoundland Dept. Mines and Energy, Current Res. Rept. 83-1, p. 68-90, 1983.

This project is essentially completed although it is intended at some point to sample selected units for isotopic dating.

NORTHWEST TERRITORIES/ TERRITOIRES DU NORD-OUEST

92. BOSTOCK, H.H., Geol. Surv. Can.:
Geology of Fort Smith, District of Mackenzie, 1980-.

See:

Fluorescent minerals from the Fort Smith area, District of Mackenzie, N.W.T.; Geol. Surv. Can., Paper 83-1B, p. 401, 402, 1983.

93. BOSTOCK, H.H., Geol. Surv. Can.:
Geology of the Hill Island Lake area, District of Mackenzie, 1982-.

See:

Preliminary geological reconnaissance of the Hill Island Lake and Taltson Lake areas, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 165-170, 1984.

94. CAMPBELL, F.H.A., Geol. Surv. Can.:
Geology of the Bathurst Inlet area, District of Mackenzie, 1974-.

95. CIESIELSKI, A., Geol. Surv. Can.:
Gneissic basement to the Fury and Hecla Formation and the Autridge Formation on Baffin Island, District of Franklin, 1979-.

96. FRASER, J.A., Geol. Surv. Can.:
Geology of Woodburn Lake map area, District of Keewatin, 1980-.

97. FRISCH, T., Geol. Surv. Can.:
Precambrian geology of southeast Ellesmere, Devon and Cobourg islands, District of Franklin, 1976-.

See:

Reconnaissance geology of the Precambrian Shield of Ellesmere, Devon and Cobourg islands, Arctic Archipelago: a preliminary account; Geol. Surv. Can., Paper 82-10, 1983.

98. FRISCH, T., Geol. Surv. Can.:
Geology of Montresor River and lower Hayes River map areas, District of Keewatin, 1982-.

99. FRITH, R.A., Geol. Surv. Can.:
Geology of Indin Lake (86B) map-area, District of Mackenzie, 1972-.

100. FRITH, R.A., Geol. Surv. Can.:
Geology of Nose Lake and Beechey Lake, District of Mackenzie, 1975-.

101. FRITH, R.A., Geol. Surv. Can.:
Geology of Beechey-Duggan Lakes area, District of Mackenzie, 1980-.

102. HENDERSON, J.B., Geol. Surv. Can.:
Healey Lake map-area, District of Mackenzie, 1978-.

103. JACKSON, G.D., Geol. Surv. Can.:
Operation Bylot, District of Franklin, 1967-.

104. JACKSON, G.D., Geol. Surv. Can.:
Operation Penny Highlands, District of Franklin, 1969-.

105. LeCHEMINANT, A.N., Geol. Surv. Can.:
Macquoid Lake (W½), Thirty Mile and Tebesjuak Lake map-areas, District of Keewatin, 1978-.

106. LeCHEMINANT, A.N., Geol. Surv. Can.:
Geology of Aberdeen Lake and parts of adjoining map areas, District of Keewatin, 1982-.

107. PUGH, D.C., Geol. Surv. Can.:
Subsurface geology of Great Bear River map-area, District of Mackenzie, 1980-.

108. SCHAU, M., Geol. Surv. Can.:
Geology of the Baker Lake map-area, District of Keewatin, 1980-.

109. TELLA, S., Geol. Surv. Can.:
Kamilukuak Lake map-area, District of Keewatin, 1979-.

110. TELLA, S., Geol. Surv. Can.:
Deep Rose Lake and parts of adjoining map areas, District of Keewatin, 1982-.

See:

Geology of parts of the Deep Rose Lake and Pelly Lake map areas, District of Keewatin; Geol. Surv. Can., Paper 84-1A, p. 313-322, 1984.

111. THOMPSON, P.H., Geol. Surv. Can.:
Tinney Hills (76J) – Overby Lake (76W½) map areas, District of Mackenzie, 1983-.

See:

Illite "crystallinity" in the Western River Formation and its significance regarding the regional metamorphism of the Early Proterozoic Goulburn Group, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 409-414, 1984.

Preliminary report on the geology of the Tinney Hills-Overby Lake (W½) map area, District of Mackenzie: a look at the Thelon tectonic zone northeast of the Bathurst Fault; ibid., p. 415-423, 1984.

112. TRETTIN, H.P., Geol. Surv. Can.:
Completion of reconnaissance geology, northern Ellesmere Island, District of Franklin, 1973-.

ONTARIO/ONTARIO

113. BRIGHT, E.G., Ontario Geol. Surv.:
Geology of Mellon Lake area, Addington and Hastings Counties, Ontario, 1984-85.

114. CARD, K.D., Geol. Surv. Can.:
Regional geological synthesis, central Superior Province, Ontario and Quebec, 1977-.

See:

Archean crust as revealed on the Kapuskasing uplift, Superior Province, Canada; Geology, vol. 11, no. 6, p. 323-326, 1983.

115. DRESSLER, B.O., Ontario Geol. Surv.:
Geological compilation 1:250 000 of areas in Ontario underlain by Proterozoic rocks, 1984-.

116. JOHNS, G.W., THURSTON, P.C., Ontario Geol. Surv.:
Long Bay-Lobstick Bay area, District of Kenora, Ontario, 1981-84.

See:

Long Bay area, District of Kenora; Ontario Geol. Surv., Misc. Paper 116, p. 11-14, 1983.

A preliminary stratigraphic model has been developed linking supracrustal sequences of the western Wabigoon Subprovince with the eastern Lake of the Woods area. The epiclastic and pyroclastic rocks of the Warclub group, mafic flows of the Snake Bay formation and mafic flows, pyroclastics and intermediate pyroclastics of the Populus volcanics have been correlated between the two regions.

The Berry River formation, part of the Warclub group, is a felsic pyroclastic unit that has been subdivided into volcanic facies. An intrusive, in part, extrusive quartz-feldspar porphyry dome occupies the central/vent facies environment. Distal and proximal depositional facies have been recognized as well as distal redeposited and epiclastic facies.

Gold mineralization in the area is related to silicified-carbonatized sheer zones and to a lesser degree to quartz-feldspar porphyry.

117. SAGE, R.P., TROWELL, N.F., Ontario Geol. Surv.:
Geology of the Wawa area, Lastheels, McMurray, Equega, and Chabanel townships, Ontario, 1979-83.

118. SAGE, R.P., TROWELL, N.F., Ontario Geol. Surv.:
Geology of the Josephine area, Corbiere, Musquash, Leclaire and Abotossaway townships, Ontario, 1981-84.

See:

Josephine area, District of Algoma; Ontario Geol. Surv., Misc. Paper 116, p. 45-49, 1983.

119. SUTCLIFFE, R.H., FYFE, W.S., Ontario Geol. Surv., Univ. Western Ontario (Geology):
Geology of the Nipigon Plate, Ontario, 1981-85.

QUÉBEC

120. CIESIELSKI, A., Geol. Surv. Can.:
Metamorphism and structure in northeast Superior Province, Québec, 1980-.

See:

Cartographie d'une partie de la sous-province archéenne d'Ungava à la hauteur de Poste-de-la-Baleine, Québec; Geol. Surv. Can., Paper 83-1B, p. 109-119, 1983.

Un reliquat de zone volcano-sédimentaire dans la sous-province archéenne d'Ungava, Québec; ibid., p. 165-175, 1983.

121. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Carte des mers postglaciaires du Canada: section de la Côte Nord du Saint-Laurent et d'Anticosti, 1980-84.

Établissement d'une carte au 1:250 000 de la zone de la mer de Goldthwait: dépôt meubles, géomorphologie paléogéographie, littoral actuel, chronologie. Compilation pratiquement terminée sur la Moyenne Côte Nord et amorcée sur la Haute et Basse Côte Nord.

122. ROY, D.W., LAVERGNE, G., PERREAULT, S., CHAMPAGNE, C., Univ. Québec à Chicoutimi (Sciences de la Terre), Québec Ministère Énergie et Ressources:
Géologie de la region des Rivieres St-Paul et St-Augustin, basse côte nord du St-Laurent, Québec; thèse de maîtrise (Lavergne, Perreault, Champagne).

SASKATCHEWAN/SASKATCHEWAN

123. GILBOY, C.F., Saskatchewan Geol. Surv.:
Sub-Athabasca basement geology, Saskatchewan, 1980-84.

The geology of the rocks underlying the Athabasca Group in northern Saskatchewan is interpreted from geophysical information and drill core, and is compiled onto 1:250 000 maps (64L; 74F, G, H, I, J, K, N, O, P). The results are most reliable where the Athabasca Group cover is less than 500 m thick as control data are generally abundant. They become increasingly unreliable with further thickening of Athabasca Group sandstone as relatively little has been done by way of geophysical surveying or drilling.

Lithostructural domains and other geological features characteristic of the area around the Athabasca Basin are recognizable under the basin. Geochemical analyses of 74 fresh core samples are presented. Most of these samples are either Archean felsic gneisses or Aphebian meta-arkoses.

124. SCHREINER, B.T., Saskatchewan Research Council (Geology):
Quaternary geology of Saskatchewan, 1974-.

See:

Lake Agassiz in Saskatchewan; Geol. Assoc. Can., Spec. Publ. No. 26, 1983.

Work is continuing in central Saskatchewan which involves fourteen 1:250 000 NTS map areas. All areas have been compiled, except for three areas in west-central Saskatchewan which should be completed in 1984/85. All information at the 1:250 000 scale will then be compiled to 1:1 000 000 for publication in 1985. Investigations of glacial and interglacial deposits are being carried out to provide information on materials and stratigraphy. This information is applied to resource studies such as groundwater, aggregates and geotechnical work. Research on Quaternary sediments and processes are continuing.

YUKON TERRITORY/ TERRITOIRE DU YUKON

125. GORDEY, S.P., Geol. Surv. Can.:
Geology of Nahanni map-area, Yukon and Northwest Territories, 1979-.

126. GORDEY, S.P., Geol. Surv. Can.:
Geology of Sheldon Lake (105I) and Tay River (105K) map area, east-central Yukon, 1982-.

ENVIRONMENTAL GEOSCIENCE/SCIENCES DE LA TERRE APPLIQUÉES A L'ENVIRONNEMENT

127. ANDERSON, J.C., BIGRAS, S.C., Environment Canada (National Hydrology Res. Instit.):
Hydrologic studies, Mackenzie Delta, Northwest Territories, 1975-85.

During construction of the Dempster Highway between Inuvik and Dawson in the 1970's, difficulties such as washouts and servere icings were encountered owing to a lack of hydrologic information for small and medium-sized drainage basins. In an effort to avoid such problems along the route of the proposed Inuvik-Tuktoyaktuk highway, Northern Hydrology Section has been collecting and analysing data at a variety of basins in the region. The primary aim has been to identify potential trouble spots (e.g. icing sites), and acquire data relevant to highway culvert and bridge design.

Field studies continued in the eastern Mackenzie Delta region in 1983 at three basins in the taiga zone south of Inuvik and six basins in the tundra zone between Inuvik and Tuktoyaktuk. Data were collected on one or more of the following variables: culvert ice accumulation thickness, late winter snowpack water equivalent, field season precipitation, air temperature, and discharge. A survey of culvert icings was conducted in the taiga zone on May 7, 1983, and accumulations were found to be generally low in thickness. Snow surveys were done in the taiga and tundra on May 15 and May 12, respectively. Prior to commencement of snowmelt runoff, precipitation, air temperature and water level recorders were installed at selected sites. Monitoring of these variables continued until late summer, while Water Survey continued to record water levels at four sites into the freeze-up period.

A report on the 1982 field season is available and analysis of 1983 data has commenced. A summary report on this study will be prepared following completion of the 1984 field season.

128. BIGRAS, S.C., Environment Canada (National Hydrology Res. Instit.):
Lake regimes, Mackenzie Delta, Northwest Territories, 1980-85.

During the spring and summer of 1983 (April to September), an intensive field study of the hydrological regime of a variety of lakes and

channels was undertaken in the Mackenzie Delta, NWT. This was the fourth year of a five year study designed to assess the potential impact of increased flow regulation upon the Delta lake levels, water quality characteristics, and the interactions between unconnected lakes, connected lakes and their channel systems.

Water levels at nine sites along the eastern sector of the Delta (Area 8-68°43'N: 134°07'W, Area 4-68°19'N: 134°33'W and Area 2-67°56'N: 134°07'W; all areas consist of a channel site, a connected lake site and an unconnected late site) were monitored using 16 mm time lapse photography from April to September. Water quality analyses of these same lakes and channels, along with a variety of other lakes and channels throughout the Delta, were undertaken prior to (April) and after break-up (June), and later on at low water level conditions (September). Other data were gathered on snowpack water equivalents, ice thickness, water temperature, wind direction and velocity, and amount of precipitation.

Abstraction and preliminary analysis of 1982 and 1983 data suggests that backwater flooding due to ice jamming during spring break-up was the critical factor in the Delta lakes' regeneration. Hydrochemical anlaysis revealed spatial and temporal trends in the Delta lakes' water quality characteristics.

129. DYCK, J.H., McKENZIE, C., Saskatchewan Research Council (Geology):
Acquisition and transformation of SRC proprietary data for a prototype microcomputer system for the Canadian Uranium Tailings Data Base (CANUT), 1983-84.

The Saskatchewan Research Council (SRC) will select SRC data which is relevant to The National Uranium Tailings Program; such as water quality, biological and radionuclide (in aquatic organisms) data. The data are entered into the existing CANUT Database through Prototype Microcomputer System developed as part of this work.

SRC has defined specifications for the Microcomputer System that will make these data conform with the data item and specification types for the CANUT Database. One or more computer processable files will be created and the data will be transmitted by telecommunictions facilities to the CANUT Database in Ottawa.

130. EGGINTON, P.A., Geol. Surv. Can.:
Periglacial processes and slope movement, central District of Keewatin, 1977-.

131. EGGINTON, P.A., Geol. Surv. Can.:
Relationship of flood frequency and heavy metal uptake in growth rings of trees, 1981-.

132. EGGINTON, P.A., Geol. Surv. Can.:
Periglacial processes, Canadian Arctic, 1983-.

133. FORTESCUE, J.A.C., Ontario Geol. Surv.:
Regional geochemical mapping in southwestern Ontario, 1981-83.

See:

The southwest Ontario geochemical survey as an example of the micromodule approach to regional geochemical mapping; Ontario Geol. Surv., Map 80 612, 1983.

A phased approach to the presentation of regional geochemical survey data from Southwest Ontario; Ontario Geol. Surv., Misc. Paper 116, p. 151-155, 1983.

Six conceptual models have been developed to explain observations on multi-element stream sediment data acquired in Southwestern Ontario in previous years. A computer file has been generated for the purpose of accessing and interpreting the data.

134. FORTESCUE, J.A.C., DICKMAN, M., TERASMAE, J., Ontario Geol. Surv., Brock Univ. (Geological Sciences):
Lake pH studies, 1980-84.

See:

Interdisciplinary research for an environmental component (acid rain) in regional geochemical surveys (Wawa area), Algoma District; Ontario Geol. Surv., Map 80 713, 1984.

The research aspect of the geochemical program has involved further work in the Wawa area.

135. GORMAN, W.A., DEVLIN, J.F., Queen's Univ. (Geological Sciences):
Chemical reactions of acid rain with soils in the Doubloon Lake basin near Sydenham, Ontario, 1983-84; B.Sc. thesis (Devlin).

Doubloon Lake near Sydenham, Ontario is located at the head of a drainage basin. It's basin contains no houses, roads, cabins, etc. A little used hiking trail passes through the basin. It was believed that no carbonate rocks existed within the basin, yet the pH of the effluent waters is 7.2. It was therefore, assumed that, since essentially no anthropogenic activity was present in the basin, the acid rain was being buffered by carbonates in the soil. The first discovery was that the soil, everywhere thin and easily accessible, was essentially free of carbonate. Despite it's easy access, it appeared that no geologic mapping had ever been carried out within the basin prior to 1983. Available geological maps were all wrong. The summer mapping program located an irregular zone of granitic gneiss-calcsilicate within the basin, and a shoal of marble within the lake. Since the soil-rain interaction could not be studied, a M.Sc. thesis project was abandoned and the work is being written up as a B.Sc. thesis.

136. JACKSON, L.E., Jr., Geol. Surv. Can.:
Environmental assessment of coal resource development, Canadian Cordillera, 1977-.

137. JACKSON, L.E., Jr., Geol. Surv. Can.:
Debris flow hazard assessment methodology, alpine and northern upland areas, 1978-.

138. LAPOINTE, M.F., Environment Canada (National Hydrology Res. Instit.):
Patterns and processes of channel changes, Mackenzie Delta, Northwest Territories, 1983-87.

Project aims: Determine the scale and patterns of channel changes over different areas of the Mackenzie Delta. In particular, clarify the nature and importance of hydrothermal, hydrodynamic ("Fluvial") and river-ice related processes in modifying channel boundaries.

Progress: An air-photo survey of channel shifting trends (20 or 30 year time-base) over the delta plain was completed. Field information was gathered in spring and summer of 1983 on bank erosion processes, channel bathymetry and boundary materials. The 1983-84 progress report is being completed.

139. LAST, W.M., Univ. Manitoba (Earth Sciences):
Geochronological discrimination of climatic change from cultural stress in representative Prairie watersheds, 1984-86.

To retrieve sediment cores from 12 selected lake basins in southern Saskatchewen and eastern Alberta; to establish a recent sediment chronology that allows differentiation of presettlement from postsettlement deposits; to evaluate long-term fluctuations in texture, mineralogy, organic content, sediment and pore-water geochemistry and relate any changes to possible causal mechanisms such as climatic variation or changes in drainage basin characteristics; to assess any recent changes in the sedimentary parameters and attempt to relate these to changing land use characteristics or specific human events; and to examine any regional changes in these sediment histories and relate these changes to either natural factors or man-induced environmental modifications.

140. LAST, W.M., BECK, A., Univ. Manitoba (Earth Sciences), Manitoba Dept. Energy and Mines:
Water quality changes and heavy metal pollution of Lake Manitoba, 1984-86.

Lake Manitoba has been the subject of considerable geolimnological investigation in recent years. The specific objectives of this project are to: (1) synthesize the existing water quality, hydrologic, geologic, and biological data on this major Prairie reservoir and to interprete this data in terms of likely overall processes and controls operating in the basin and watershed; (2) investigate the specific roles of precipitation/dissolution of endogenic and authigenic mineral components in both short and long-term water chemistry fluctuations; and (3) determine the magnitude of selected toxic metal contamination in the basin and examine the geochemistry of these trace metals in the water and sediments.

141. MACYK, T.M., Alberta Research Council (Soils):
Reclamation Smoky River Coal Ltd., Alberta, 1972-88.

Commissioned in 1971, an on-going reclamation study has been conducted by the Soils Department of the Alberta Research Council on behalf of Smoky River Coal Ltd. at their open-pit mine operations near Grande Cache, Alberta to determine methods of establishing long-term cover that would be in harmony with adjacent, undisturbed areas. The soils occurring in the pre-mining state as well as the soils reconstructed after mining were characterized.

Plot studies to determine the suitability and adaptibility of various agronomic and native grasses and legumes were established. Fertilization trials were included. Conifer seedlings and rooted cuttings of deciduous species were planted in the disturbed areas following establishment of a grass and legume cover. Long term results indicate that agronomic species including alfalfa will thrive and reproduce and that tree seedlings will co-exist with the initially established grass and legume cover. The results obtained from the research effort have been successfully transferred to the operational mine scale.

142. PROWSE, T.D., Environment Canada (National Hydrology Res. Instit.):
River ice jams, Mackenzie River Basin, Northwest Territories, 1982-.

During a four week period in the spring of 1983 an intensive field study of ice jam processes was undertaken at the confluence of the Liard and Mackenzie Rivers. During break-up, the downstream advance of the break-up front was monitored by light aircraft using an Enviropod 35 mm remotely-controlled, camera system and a field portable video camera and recorder. Two 16 mm time-lapse cameras were also located on the ground at the mouth of the Liard River. Hydrometeorological observations near the confluence included ice surveys, water level and velocity measurements, and the measurement of the energy balance of the ice sheet prior to break-up. Once a jam was established, water temperatures were also measured using an infra-red radiation thermometer at the leading edge of open water and in holes within the jam. The jam remained intact for just over one week which offered a unique opportunity to study the processes which lead to the deterioration and final release of ice jams. Preliminary results suggest that although the processes of break-up and jam lodgement are primarily hydro-mechanical, hydrothermal processes play a large role in the deterioration of ice jams. Relevant hydrologic and climatic data records are now being analyzed to determine

the long-term, relative importance of hydro-thermal and mechanical forces to break-up and ice jamming.

This study will continue in the spring of 1984, augmented by a more intensive network of survey control stations and measurements of the change in mechanical strength of the ice cover prior to break-up. An associated study, to determine the long-term frequency and magnitude of backwater produced by ice jams in the Fort Simpson area is also continuing.

143. RODRIQUES, E., SIBUL, U., Ontario Ministry Environment (Water Resources Br.):
Effects of road-salting on shallow aquifers, southern Ontario, 1984-85.

To determine the effects of road-salting on shallow aquifers in different geological environments in Ontario. Geophysical techniques will be used to determine the intensity, the rate of movement and the areal extent of contamination along selected highways.

The results will be used to provide guidelines to well drillers and new well owners regarding minimum distances from highways where shallow wells can be drilled to avoid contamination by road salting.

144. SHILTS, W.W., Geol. Surv. Can.:
Sensitivity of surficial sediments to effects of acid precipitation, 1980-.

GEOCHEMISTRY/GÉOCHIMIE

ANALYTICAL METHODS AND ANALYSIS/ MÉTHODES ANALYTIQUES ET ANALYSES

145. CHAN, C., BAIG, M.W., RIDDLE, C., Ontario Geol. Surv.:
Development of new or improved methods of chemical/instrumental determination of elemental components in geological materials.

See:

Semi-automated method for the determination of selenium in rocks; Analytical Letters, vol. 17(A2), 1983.

Semiautomated determination of fluoride in rocks; American Laboratory, vol. 32, 1983.

New applications of graphite furnace to geoanalysis determination of tellurium and thallium.

146. LACHANCE, G.R., Geol. Surv. Can.:
Development of methods for the analysis of geological materials, 1969-.

147. STEGER, H.F., BOWMAN, W.A., SABOURIN, R.G., EMR (CANMET):
Canadian certified reference materials project (CCRMP), 1970-.

See:

Radium-226 in certified uranium reference ores DL-1a, BL-4a, DH-1a and BL-5; CANMET Rept. 83-9E, 1983.

TAN-1: A certified tantalum reference ore; CANMET Rept. 83-10E, 1983.

MP-2: A certified tungsten-molybdenum reference ore; CANMET Rept. 83-14E, 1983.

In this period, the certification of a gold tailings sample GTS-1 and a base metal ore KC-1a was completed. A program to determine the Pb-210 content of four CCRMP uranium ores was completed. A suite of four uranium tailings samples was characterized with respect to 9-11 elements and 4 to 7 radionuclides. The report is in preparation and should be available in June 1984.

148. VANDER VOET, ., RIDDLE, C., Ontario Geol. Surv.:
Determination of rare earth elements in geological materials using high performance liquid chromatography/inductively coupled argon plasma/optical emission and mass spectroscopy, 1982-86.

EXPLORATION, ORGANIC/ APPLIQUÉE, ORGANIQUE

149. BARNES, M.A., BARNES, W.C., Univ. British Columbia (Geological Sciences):
Diagenesis of diterpene acids and hydrocarbons in Recent sediments, 1983-86.

Diterpenes are biological markers commonly used for oil-source rock correlations and as indicators of terrigenous sources in sediments, peats and coals. Diterpene hydrocarbons occur in Beaufort-Mackenzie oils which are associated with sediments with a high resinite content.

Powell Lake provides a unique environment for the investigation of the effect of oxidizing and reducing depositional environments on aromatization processes. Anoxic sediments in Powell Lake show 100 to 8000-fold enrichment in aromatic diterpene hydrocarbons relative to oxic sediments which share common plantic and coniferous sources. Changes in distribution of resin acids are being measured to investigate their role as potential precursors of the aromatic hydrocarbons.

150. BERTRAND, R., HÉROUX, Y., KUBLER, B., INRS-Géoressources, Univ. Neuchatel (Suisse):
Maturation thermique, potentiel pétroligène et histoire de la catagenèse des roches post-taconiques de la Gaspésie et de l'Île Anticosti, 1983-86; thèse de doctorate (Bertrand).

Cette étude vise à 1) corréler des indicateurs de maturation thermique organique (géochimique et pétrographique) et minéral (argile), 2) à mettre au point des indicateurs pétrographiques nouveaux dans la M.O.D. de roches dépourvues de vitrinite, 3) à faire la paléogéographie de la maturation thermique et du potentiel pétroligène des deux régions et 4) à faire des hypothèses sur l'histoire de cette maturation.

151. JONASSON, I.R., Geol. Surv. Can.:
Environmental geochemistry, 1974-.

See:

Geochemistry and hydrothermal alteration studies of the Whiting Creek stockwork molybdenum deposit, Tahtsa Lake area, British Columbia; Geol. Surv. Can., Paper 83-1B, p. 135-144, 1983.

152. POWELL, T.G., Geol. Surv. Can.:
Hydrocarbon geochemistry of Arctic Archipelago and Canadian East Coast offshore, 1976-.

153. SNOWDON, L.R., Geol. Surv. Can.:
Development of extraction, identification and correlation systems for organic compounds from sedimentary rocks and crude oils, 1973-.

154. SNOWDON, L.R., Geol. Surv. Can.:
Hydrocarbon geochemistry of northern Interior Plains and Beaufort Sea, 1976-.

155. SNOWDON, L.R., Geol. Surv. Can.:
Oil shale resources of Canada, 1982-.

156. TRUDEL, P., BAZINET, R., CLOUTIER, M.A., BOIVIN, M., École Polytechnique (Génie minéral), Québec Ministère Énergie et Ressources:
Evaluation du potentiel minéral des grands axes conducteurs identifiés en Abitibi par les levés INPUT, 1983-85; M.Sc.A. (Cloutier, Boivin).

Voir:

Evaluation du potentiel minéral d'un grand axe conducteur identifié lors de levés INPUT dans le canton de Richardson, région de Chibougamau; Québec Ministère Énergie et Ressources, DV 83-13, p. 71, 1983.

Le but de ce projet est de valoriser la recherche de minéralisation économique à l'intérieur des grands axes conducteurs qui ont traditionnellement été négligés par les compagnies minières au profit des conducteurs ponctuels. Ce projet amènera des présentations orales au congrès de l'ACFAS (Québec, mai 1984), ainsi que des communications écrites et orales lors du symposium du CIMM (Chibougamau, septembre 1984).

EXPLORATION, NON-ORGANIC/ APPLIQUÉE,NON-ORGANIQUE

157. AFTABI, A., AZZARIA, L.M., Univ. Laval (Géologie):
Evaluation of the geochemical dispersion of Hg, Au, Ag, As, Zn, Cu, Ni and Zr in relation to gold mineralisation at Sigma gold mine, Val d'Or, Québec, 1981-84; Ph.D. thesis (Aftabi).

See:

Distribution of mercury compounds in ore and country rocks at Sigma gold mine, Val d'Or, Québec, Canada; J. Geochem. Expl., vol. 19, p. 447-466, 1983.

Hg phases, Au, Ag, As, Zn, Cu, Ni, and Zr are being determined in ore and host rocks to evaluate their distribution as ore guides. Mercury phases are determined by successive stepwise heating of samples in air and collecting the liberated mercury and gold. The gold is then heated to liberate the trapped mercury which is measured by flameless atomic absorption.

158. BEAUMIER, M., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de lac, région de la Rivière Baleine, Nouveau-Québec, 1983-85.

159. BEAUMIER, M., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de lac, région de la Rivière Caniapiscau, Québec, 1983-85.

Inventaire des dispersions géochimiques dans les sédiments de lac afin de définir des cibles d'exploration et des éléments géologique.

160. BEAUMIER, M., LEFEBVRE, D.L., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de lac et levé gravimétrique de la région de Schefferville, Québec, 1984-85.

Inventaire des dispersions géochimiques dans les sédiments de lac ainsi que l'évaluation gravimétrique du socle rocheux.

161. BOYLE, D.R., Geol. Surv. Can.:
Regional geochemistry, Newfoundland and Labrador, 1976-.

162. BUTLER, A.J., DAVENPORT, P.H., Newfoundland Dept. Mines and Energy:
Geochemical follow-up of metal anomalies from lake sediment reconnaissance program, 1983-.

See:

Geochemical follow-up studies in eastern Newfoundland; Newfoundland Dept. Mines and Energy, Min. Devel. Div., Rept. 84-1, p. 267-270, 1984.

Geoscience studies in the Weir's Pond area, northeast of Gander, Newfoundland; ibid., p. 271-278, 1984.

Four anomalous areas were isolated from a regional lake sediment survey on the Avalon and Gander Zones in Eastern Newfoundland. These areas were evaluated in more detail using stream sediment and stream water geochemistry and minor stream prospecting. Work in an area in the Gander Zone was also supplemented by geophysics and Quaternary mapping. An attempt will be made to interpret the source of these anomalies and further define their limits.

163. CHOINIÈRE, J., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de ruisseau de la région de Mont-Joli, Québec, 1983-84.

164. CHOINIÈRE, J., Québec Ministère Énergie et Ressources:
Géochimie des sols et des tills de la région de Thetford-Mines, Québec, 1983-84.

Ce project vise à stimuler l'exploration minière dans la région de Thetford-Mines et d'y diversifier l'économie minérale en décelant des cibles géochimiques.

165. COUTURE, B., DARLING, R., École Polytechnique (Génie mineral):
Petrography and geochemistry of the hydrothermal alteration pipe, Decoeur-Garon property, Quebec, 1982-84; M.Sc.A. thesis (Couture).

166. DUNN, C.E., Saskatchewan Geol. Surv.:
Lake-sediment geochemistry, northern Saskatchewan, 1975-84.

See:

Lake water and lake sediment geochemistry, NEA/IAEA Athabasca test area; Geol. Surv. Can., Paper 82-11, p. 117-125, 1983.

167. DUNN, C.E., Saskatchewan Geol. Surv.:
The application of biogeochemistry to mineral exploration in Saskatchewan, 1979-.

See:

Detailed biogeochemical studies for uranium in the NEA/IAEA Athabasca test area; Geol. Surv. Can., Paper 82-11, p. 259-272, 1983.

Uranium biogeochemistry of the NEA/IAEA Athabasca test area; ibid., p. 127-132, 1983.

Biogeochemical investigations in northern Saskatchewan: Preliminary data on tungsten, gold, platinum, rare-earths and uranium; Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 106-122, 1983.

The application of biogeochemical methods to mineral exploration in the boreal forests of central Canada; in: Organic Matter, Biological Systems and Mineral Exploration, vol. no. V, Prentice Hall, 1984.

Investigations extended into regional biogeochemical patterns of gold distribution; local uptake by vegetation of platinum, palladium and rare-earth elements. Extension of study on patterns of uranium distribution throughout the northern forests.

168. FEDIKOW, M.A.F., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Geology and geochemical studies associated with the Agassiz metallotect, Lynn Lake, Manitoba, 1982-.

Development of biogeochemical and peat geochemical exploration tools for stratabound gold mineralization in areas of little or no outcrop. Capacity for utilization of peat bogs as sampling media for geochemical exploration for mineral deposits.

169. FORTESCUE, J.A.C., GEDDES, R.S., LOURIM, J., Ontario Geol. Surv.:
Basal till studies, Ontario, 1979-84.

See:

Further studies of the geochemistry and mineralogy of basal tills and related materials from the Kirkland Lake area, Districts of Timiskaming and Cochrane; Ontario Geol. Surv., Misc. Paper 116, p. 156-158, 1983.

A small scale geochemistry/Quaternary geology study in the Hemlo Camp, District of Thunder Bay; ibid., p. 159-160, 1983.

The provision of information on the utility of geochemical exploration techniques form the basis for 2 studies presently underway. The first involves the synthesis and analysis of basal till geochemistry and mineralogy obtained during the Kirkland Lake Initiatives Program (KLIP), carried out in previous years in the Kirkland Lake area. The second involves field sampling completed for a small scale research project on the Williams claim under option to Lac Minerals Limited in the Hemlo area. The later has been designed as an interdisciplinary project involving input from both geochemistry and Quaternary geology for the purpose of investigating the overburden characteristics of gold, and associated pathfinder elements in the area of the ore deposit.

170. FORTESCUE, J.A.C., LOURIM, J., Ontario Geol. Surv.:
Lake sediment Survey – Bathchawana area, Ontario, 1983-84.

See:

A small scale mineral resource appraisal and environmental geochemical survey in the Batchawana Mountain area, District of Algoma; Ontario Geol. Surv., Misc. Paper 116, p. 164-165, 1983.

171. FOSCOLOS, A.E., Geol. Surv. Can.:
Clay and clay minerals investigation, 1968-.

172. GORZYNSKI, G., GODWIN, C.I., Univ. British Columbia (Geological Sciences):
Lithogeochemistry of mineralization and host at cirque deposit, northeastern British Columbia, 1980-85; M.Sc. thesis (Gorzynski).

Thesis completion depends upon analysis of a very large body of excellent data. Emphasis will be on interpretations of Pb, Zn, Zr and REE distributions in different stratigraphic units.

173. GOYER, M., LANGLAIS, L., FOREST, G., Québec Ministère Énergie et Ressources:
Evaluation du potentiel économique de la faille du Grand Pabos, Québec, 1981-84.

Recherche de nouveaux indices minéralisés de type skarn et de type porphyry copper par des levés (3) géochimiques tactiques de sol (13 000 éch. au 300 m x 50 m) et par une cartographie géologique détaillée (1:5 000) le long d'une faille longitudinale profonde où plusieurs indices de même types ont été rapportés. Recherche de nouveaux traceurs géochimiques et complément de la carte géologique régionale.

174. HALE, W.E., BURKE, K.B.S., BACHINSKI, S.W., Univ. New Brunswick (Geology):
U and Th in rocks of southwestern New Brunswick, 1979-84; Ph.D. thesis (Hassan).

A study by in situ X-ray spectrometer survey and NAA indicates the distribution of U and Th in rocks of southwestern New Brunswick. In the course of investigation new mineralization discovered in area.

175. HEBERLEIN, D.R., GODWIN, C.I., FLETCHER, W.K., Univ. British Columbia (Geological Sciences):
Alteration, mineralization and geochemistry of the Berg Porphyry copper molybdenum deposit, north-central British Columbia, 1980-84; M.Sc. thesis (Heberlein).

See:

Lithogeochemistry of hypogene, supergene and leached cap samples, Berg Porphyry copper deposit, British Columbia; J. Geochem. Expl., vol. 19, p. 595-609, 1983.

Hypogene alteration at the Berg Porphyry copper-molybdenum deposit, north-central British Columbia; Econ. Geol., v. 79, 1984.

In this thesis hypogene alteration and mineralization are related to the emplacement of a circa 50 Ma quartz monzonite stock into a brittle hornfels associated with an earlier quartz diorite intrusion. This hornfels has been hydrothermally altered by the quartz monzonite and the addition of potassium to the rock is demonstrated using major element ternary plots. Models for deposition of pyrite, chalcopyrite and molybdenite are proposed based on mineralogical associations and textures.

Geochemical patterns in the hypogene zone (trace elements) are closely related to observed mineral zones. These patterns show little modification as a result of supergene enrichment and thus can be traced with little modification to surface. Vertical remobilization of elements is demonstrated using sequential extractions and element ratios. It is found that Cu, Mn and Zn are depleted at surface and Mo, Pb and Ag are enriched. These elements will produce a characteristic anomaly in a highly leached deposit.

Leaching and supergene enrichment are affected by topography as shown by sequential extraction ratios. Water table fluctuations cause supergene sulfide to be oxidized to supergene oxide. This occurs most intensly on steep slopes. Seasonal variations in rainfall control leaching potential of groundwaters. This is demonstrated by analysis of stream precipitates collected over the course of a summer as water pH decreases.

176. HORNBROOK, E.H.W., Geol. Surv. Can.:
National geochemical reconnaissance, 1975-.

177. JONASSON, I.R., Geol. Surv. Can.:
Trace elements in sulphides, 1974-.

See:

A preliminary report on the gold content of sulphide separates from some Canadian base-metal deposits; Geol. Surv. Can., Paper 83-1B, p. 47-52, 1983.

178. JURAS, S., GODWIN, C.I., Univ. British Columbia (Geological Sciences):
Geology of Buttle Lake Kuroko-type deposits with emphasis on Price zone, 1981-86; PH.D. thesis (Juras).

Detailed mapping, logging and sampling of Price Hillside, Buttle Lake Camp. Current emphasis is on lithogeochemistry and geochronometry of mapped stratigraphy.

179. KNIGHT, J., Univ. British Columbia (Geological Sciences):
Placer gold of the Fraser River drainage area, British Columbia, 1982-84; M.Sc. thesis.

180. LEVINSON, A.A., GINTAUTAS, P.A., Univ. Calgary (Geology and Geophysics):
Lake sediment and lake water studies from the Nechako Plateau, British Columbia, 1982-84; M.Sc. thesis (Gintautas).

See:

The measurement of $^{226}Ra/^{223}Ra$ activity ratios in ground water as a uranium exploration technique; J. Geochemical Expl., vol. 19, p. 187-193, 1983.

Uranium series disequilibrium in surficial uranium deposits in southern British Columbia; Can. J. Earth Sci., vol. 21, no. 5, p. 559-566, 1984.

181. LONGSTAFFE, F.J., Univ. Alberta (Geology):
Stable isotope studies of diagenesis in clastic rocks, 1982-.

See:

Stable isotope studies of diagenesis in clastic rocks; Geoscience Canada, vol. 10, p. 43-58, 1983.

To use oxygen and hydrogen isotope methods to deduce the physicochemical conditions that existed during various stages of diagenesis in sandstones and shales. The technique can provide unique data concerning paleotemperatures and paleoflow regimes in sedimentary basins.

182. LONGSTAFFE, F.J., NESBITT, B.E., ANSDELL, K., Univ. Alberta (Geology):
Stable isotope geochemistry of sediment-hosted mineralization, Selwyn Basin, Yukon, 1981-.

To develop models for the genesis of mineralized zones within sediment-hosted Pb-Zn-Ba deposits in the Selwyn Basin. Our approach is to elucidate the conditions of ore-formation and the nature of ore-fluids by examining the extent and type of water-rock interaction between the shale host-rocks and the ore-bearing fluids. This interaction is manifested by $^{18}O/^{16}O$ variations and mineralogical changes in the host rocks (and associated vein minerals) that can be related to physiocochemical conditions during ore formation. The Tom deposit is under specific study now.

183. MAURICE, Y.T., Geol. Surv. Can.:
Regional geochemistry northern Canadian Shield, 1978-.

See:

Gold, tin, uranium and other elements in the Proterozoic Nonacho sediments and adjacent basement rocks near MacInnis Lake, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 229-238, 1984.

184. MAURICE, Y.T , Geol. Surv. Can.:
Geochemical exploration technology in ultrabasic complexes, 1983-.

185. McCONNELL, J.W., Newfoundland Dept. Mines and Energy:
Reconnaissance and follow-up lake sediment/water, stream sediment/water and soil geochemistry in Labrador, 1978-85.

Geochemical data for 8,000+ reconnaissance lake sample sites have been aggregated into a grid of 1,400 ten kilometre square data cells. Multivariate statistical analysis reveals several significant elment associations. Lake depth and Fe/Mn content and, to a lesser extent loss-on-ignition, greatly influence the concentration levels of many elements in sediments. Linear regression analysis has been used to remove these components and calculate residual values for relevant elements, notably Cu, Zn, Ni, Mo and F. Coloured contour maps of residual and untreated data have been included in the report on base metals. Patterns in the geochemical data can be related, in many instances, to areas of known mineralization or to distinctive bedrock lithologies. Follow-up geochemistry over 9 base metal anomalies is discussed and illustrated.

A second report focusing on the application of reconnaissance and follow-up geochemistry in the exploration for uranium mineralization is in progress.

186. McCONNELL, J.W., Newfoundland Dept. Mines and Energy:
Geochemical exploration of metalliferous granites, 1982-85.

The project is evaluating the effectiveness of various geochemical techniques in the search for Sn-W-Mo mineralization in Newfoundland granites. Project areas are selected on the basis of regional lake sediment data. Six areas have been sampled to present. The 1984 field season will be the last and a final report will be published in 1985.

187. MELLINGER, M., SMITH, J.W.J., Saskatchewan Research Council (Geology):
Geochemistry and data analysis, 1980-.

See:

The evaluation of lithogeochemical data using multivariate analysis: application to the Athabasca Basin of Saskatchewan (Canada); Proc. Vol. APCOM '84 (London, UK), 1984.

The application of correspondence analysis to the study of lithogeochemical data: general strategy and coding schemes; J. Geochem. Expl., Proc. Vol. 10th IGES (Helsinki, Finland), 1984.

Tails Analysis (a method for the study of element associations in "anomalous" concentration ranges); Saskatchewan Research Council, Publ. R-740-4-B-83, 1983.

Graphics software for data analysis - Vol. I to V; ibid., Publ. R-740-5-B-83 and R-740-g-B-83, 1984.

To establish an effective methodology for lithogeochemical exploration and the interpretation of lithogeochemical data; and develop new usage of existing data analysis methods, develop new data analysis methods, develop felxible data analysis software. Apply and test methodology and techniques in uranium exploration (Athabasca Basin), gold metallogenesis (Saskatchewan).

188. MOSSMAN, D.J., GROSOVSKY, B.D.D., NAGY, B., Mount Allison Univ. (Geology), Boston Univ. (Biology), Univ. Arizona:
Aspects of the geochemistry of Witwatersrand-type gold deposits, and the possible infuence of ancient prokaryotic communities on gold concentrations, 1983-.

See:

Origin and distribution of gold in Huronian Supergroup, Canada - the case for Witwatersrand-type paleoplacers; J. Precambrian Geol., vol. 20, p. 543-583, 1983.

Witwatersrand-type paleoplacer gold in the Huronian Supergroup of Ontario, Canada; Geoscience Canada, vol. 11, no. 1, 1984.

To further investigate the distribution of paleoplacer gold in the Huronian and to elucidate aspects of the geochemistry of Huronian paleoplacer gold particularly with respect to possible biomineralization. In which way might the organic precursors of kerogen (thucholite) have functioned to help redistribute and concentrate gold under the anoxic atmospheric conditions that are considered to have prevailed during the lower Proterozoic? The hypothesis explored is that some of the organic material associated with gold (and for uraninite) may be fossilized remains of prokaryotic communities, and that the existence of these communities influenced the concentration of the gold under conditions existing 2.5 Ga ago.

189. MOSSMAN, D.J., MACKINTOSH, A.D., Mount Allison Univ. (Geology), Cominco (Potash Division):
Nature, origin and prediction by geochemical and associated techniques of salt solution collapse phenomena in bedded potash deposits, 1982-.

To classify by kind, to gain an understanding of the various geologic origins (and the processes involved), and to learn how to predict by geochemical and geophysical means the whereabouts, of salt-solution collapse features within the potash ore zones of Canadian potash mines.

190. NIELSEN, E., FEDIKOW, M.A.F., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Basal till geochemical investigations at the Agassiz Au-Ag deposit, Lynn Lake, Manitoba, 1982-85.

Detailed sampling of the basal till on the down-ice side of the Agassiz Au-Ag deposit was undertaken in 1983. Analysis of the clay sized fraction produced anomalous values in Cu, Ni, Pb, Zn and As. Anomalous values were also obtained for Au in the heavy mineral fraction. The 10 to 15 m wide ore zone produced anomalies in the overburden more than 150 m long in the down-ice direction.

191. PELLETIER, M., Québec Ministère Énergie et Ressources:
Géochimie des sédiments de lac, région de la Baie Johan-Beetz, Basse Côte Nord, Québec, 1983-84.

Inventaire détaillé de la région de Johan-Beetz contenant des roches volcaniques par la méthode de sédiments de fond de lac. Ce levé fut effectué pour définir des cibles d'exploration et des éléments géologiques.

192. PELLETIER, M., Québec Ministère Énergie et Ressources:
Hydrogéochimie de la rive sud du Saint-Laurent, 1984.

Inventaire hydrogéochimique du sud du Saint-Laurent pour définir des cibles d'exploration et des éléments géologiques.

193. PELLETIER, M., CHOINIÈRE, J., Québec Ministère Énergie et Ressources:
Hydrogéochimie de la Beauce, Québec, 1984-85.

Inventaire hydrogéochimique de la région de Thetford pour définir des cibles d'exploration et des éléments géologiques.

194. PERRAULT, G., TANER, M., TRUDEL, P., École Polytechnique (Génie minéral), Québec Ministère Énergie et Ressources:
Etude de la dispersion de l'or autour des gîtes minéraux, région de Lamaque-New Pascalis, Val d'Or, Québec, 1983-85.

Voir:

Distribution of gold, arsenic, antimony and tungsten in the host rocks of the eastern Val d'Or area, Quebec; CIM Bull. 77, Abstract, p. 88, 89, 1984.

Plusieurs roches du secteur et de Val d'Or contiennent beaucoup d'or: la granodiorite de Bourlamaque, les pyroclastites de la formation Val D'Or. Il est possible que les gîtes d'or soient créés par une remobilisation de cet or.

195. ROGERS, P.J., MACDONALD, M.A., Nova Scotia Dept. Mines and Energy:
Geochemistry of sediments and waters northern Nova Scotia, 1982-84.

Stream sediment sampling coverage completed for northern Nova Scotia. Lake sediment survey completed for eastern Cape Breton Island. Complementary water samples were also collected during 1983. All sediments samples submitted for routine AAS analysis for Cu, Pb, Zn, Ag, Co, Ni, Fe, Mn, Mo, Hg, U and As, the waters for U, F and pH.

Orientation studies were completed at West Gore, Debert Lake, Sugarloaf Mountain and Lochaber Lake. Monitoring of monthly variations in stream sediments continued. Publication of the 1982 data as Open Files commenced with 1:50 000 UTM sheets with single element values and basic statistics. Regional compilation at 1:250 000 will follow when all analyses are available.

196. SCHRIJVER, K., INRS-Géoressources:
Métaux-traces dans les résidus insolubles: apport à l'exploration lithogéochimique et à la métallogénie des gîtes de type de la Vallée du Mississippi, 1983-89.

197. SMITH, P.K., KEPPIE, J.D., HAYNES, S.J., O'BRIEN, B.H., O'REILLY, G.A., Nova Scotia Dept. Mines and Energy:
Meguma Group gold project, Nova Scotia, 1982-84.

See:

The amphibolite grade turbidite hosted gold deposit at Cochrane Hill – geochemical significance; Nova Scotia Dept. Mines and Energy, Report 84-1, 1984.

Geology of the Cochrane Hill gold deposit, Guysborough County, Nova Scotia; Nova Scotia Dept. Mines and Energy, Report 83-1, 1983.

Cochrane Hill gold mine; in: Gold deposits in the Meguma Terrane of Nova Scotia; CIM Geol. Div. Excursion Guidebook, 1983.

Smith will be mapping and conducting further examinations of several of Nova Scotia's gold deposits and may conduct further investigations of the Cochrane Hill Gold Deposit at the Ph.D. level, examining various aspects of this mineralization in an attempt to further define the factors which are influencing the sites of gold deposition. This will include lithogeochemistry as well as silicate and ore mineral chemistry. Isotope work may be used to add further weight to the interpretation.

198. THEYER, P., Manitoba Dept. Energy and Mines (Geol. Sciences Br.):
Platinum group metals in the Bird River Sill, Manitoba, 1982-.

Research on the Platinum group metals content of a mafic-ultramafic layered sill. Relations between PGM contents, petrology and geochemistry.

199. WADIEN, R., HALDEN, N.M., LAST, W.M., Univ. Manitoba (Earth Sciences):
Geochemistry and hydrogeology of saline spring waters of the Winnipegosis area, Manitoba, 1983-84; M.Sc. thesis (Wadien).

The saline springs of Manitoba discharge from Devonian rocks on the west side of Lake Winnipegosis and Lake Manitoba. The two areas with the highest concentration of springs are the south end of Lake Winnipegosis, and the Dawson Bay area. Samples from six sites were collected and analyzed. The spring waters sampled were found to have salinities ranging from 7-55 g/l. The variation is due to mixing and dilution with fresh groundwaters. Br/Cl ratios suggest that the salinities of these springs is due to the solution of halite beds. A possible source of the halite is the Middle Devonian Prairie Evaporite. Solution collapse structures and abnormal thicknesses in overlying formations suggest that widespread dissolution of these beds may have occurred.

200. WARREN, H.V., Univ. British Columbia (Geological Sciences):
Southern branches of the Pinchi Fault, potential for new gold, copper and mercury mines, British Columbia, 1983-84.

See:

Biogeochemistry: A prospecting tool in the search for mercury mineralization; J. Geochemical Explor., vol. 18, p. 169-183, 1983.

Mineral indications along the Pinchi Fault; Western Miner, vol. 56, no. 6, p. 25-30, 1983.

Having demonstrated a relationship between anomalous concentrations of mercury with the Pinchi Fault, we now intend to follow up by seeing if mercury anomalies may be used to detect the presence of other major faults buried under overburden.

201. WATKINSON, D.H., DILLON-LEITCH, H., McEWEN, J., Carleton Univ. (Geology):
Geochemistry of precious metal concentrations in some Ni-Cu-PGE and Cu-Zn-Ag-Au deposits, 1981-84; Ph.D. thesis (Dillon-Leitch), M.Sc. thesis (McEwen).

GENERAL/GÉNÉRALITÉS

202. ABELL, P., HENDRY, H.E., WHEATLEY, K., Univ. Saskatchewan (Geological Sciences), Univ. Rhode Island:
Carbon and oxygen isotopes of the Carswell Dolomite, Saskatchewan, 1982-84.

Values of $S^{18}O$ through the dolomites in the lowest 110 m of the Carswell Formation (Proterozoic, northern Saskatchewan) in drill-hole CAR58 (drilled by AMOK Ltd.) are mainly in the range of about -9% to -6% (PDB) and show a general upward trend from low to high values. The upward trend and two anomalously high values (up to -3%) can be interpreted in terms of the depositional history.

203. BALLANTYNE, S.B., Geol. Surv. Can.:
Regional geochemistry – southern Cordillera, 1979-.

204. BAPAGAR, W.R.A., Geol. Surv. Can.:
Stratigraphy and geochemistry of the volcanic rocks of the Circum-Ungava Belt, District of Keewatin, 1978-.

205. BERGERON, M., SHAW, D.M., McMaster Univ. (Geology):
Behaviour of boron in the oceanic lithosphere, 1981-84.

See:

The behaviour of boron in the oceanic lithosphere; Geol. Assoc. Can. – Mineral Assoc. Can., Program with Abstracts, vol. 9, p. 46, 1984.

Variations in boron distribution in altered basalts; ibid., vol. 8, p. A6, 1983.

In order to better understand the behaviour of boron in the oceanic environment we have analysed basalts, serpentinites, spilites and clays from the oceanic lithosphere by PGNAA (prompt gamma neutron activation analysis).

The boron content of oceanic basalts increases with the extent of low temperature alteration. Therefore, boron is correlated with alteration indices such as Fe^2O^3/FeO, potassium, rubidium, H^2O. Samples of basalts from Troodos ophiolite show a clear trend with depth, related to the extent of low-temperature alteration. Moreover for these samples a graph of the ratio of potassium/boron versus potassium permits the distinction of two clear trends which might reflect different stages of low temperature basalt alteration. The first is marked by an increase in B content with constant K. The second trend is characterised by simultaneous increase in B and K.

Extractions on 4 strongly altered basalts and 2 oceanic serpentinites reveal that the boron is easily extracted and that amorphous Fe oxides can absorb large quantities of B. The transformation of amorphous to crystalline Fe oxides results in a nearly total loss of B. Extractions performed on ophiolite serpentinities, carbonate-rich spilite and clays demonstrate that in these rocks B is tightly bound and is absent from the carbonate phases of the spilites.

To study the effect of hydrothermal alteration (>150°C) we have analysed samples from the Thetford Mines and the Troodos ophiolites. The results suggest that B is released at the first sign of hydrothermal alteration. Also in these rocks the boron content seems to be a rough indication of the water/rock ratio. For the Troodos samples a high ratio rubidium/boron (>2) reflects rock conditions of hydrothermal alteration.

206. BLACKWELL, B.A.L., RUTTER, N.W., Univ. Alberta (Geology):
Amino acid racemization ratios and inferred ages for bones and teeth from the Charente and Pordogne, France, 1981-85; Ph.D. thesis (Blackwell).

207. BOYLE, R.W., Geol. Surv. Can.:
Geochemistry of metallogenesis and primary halos, 1973-.

208. BRAND, U., MORRISON, J.O., Brock Univ. (Geological Sciences):
Carbonate geochemistry, 1980-86; M.Sc. thesis (Morrison).

See:

A salinity equation: chemical evaluation of molluscan aragonite; 1984 Book of Abstracts, SEPM Midyear Meeting, San Jose, Calif. Aug. 11, 1984.

Diagenetic history and fluid migration pathways of Silurian formations, Michigan basin; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 48, 1984.

Secular and environmental variation of seawater: an example of brachiopod chemistry; ibid., vol. 9, p. 91, 1984.

209. CAMERON, E.M., Geol. Surv. Can.:
Isotopic geochemistry, Precambrian mineralized basins, District of Mackenzie and Ontario, 1980-.

210. DYCK, W., Geol. Surv. Can.:
Disequilibrium in the uranium series, 1978-.

See:

A study of uranium-rich reduction spheroids in sandstones from Pugwash Harbour, Nova Scotia; Can. J. Earth Sci., vol. 20, no. 11, p. 1738-1746, 1983.

211. ELLWOOD, D.J., Geol. Surv. Can.:
Geochemical information system, 1975-.

212. ERDMAN, L.R., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
Tectonic setting of Tertiary magmas of British Columbia and Mesozoic magmas of Vancouver Island by use of rare earth element and trace element discrimination diagrams, 1982-84; M.Sc. thesis (Erdman).

X-ray fluorescence analyses are complete for 67 Tertiary volcanic rocks (mainly basalts but some andesites) from all volcanic belts of B.C. giving all major and 10 trace element concentrations. Neutron Activation analyses provide 12 additional trace and rare earth concentrations for each sample. Discrimination diagrams using trace elements and rare earth elements will be plotted to determine tectonic setting at the time the volcanics were erupted. This part of the project is nearly complete.

Similar analyses are being done for 35 volcanic and plutonic Mesozoic rocks from Vancouver Island. Discrimination diagrams from these results should shed light on the Mesozoic tectonics of Vancouver Island.

213. GOFF, S.P., GODFREY, J.D., Alberta Research Council (Geol. Surv.):
Geochemical-petrological study of the Canadian Shield on northeastern Alberta, 1981-84.

Petrogenesis of major rock groups – granitoids, gneisses, amphibolites, metasediments and mylonites – under examination. Derivation of average crustal composition based on areal mapping, chemical and mineralogical analyses. Numerical data to be processed for multivariate analysis and discriminating analysis of major and trace elements.

214. GOODFELLOW, W.D., Geol. Surv. Can.:
Regional geochemistry, Yukon Territory, 1977-.

215. GOODFELLOW, W.D., Geol. Surv. Can.:
Geochemistry of mineral occurrences and their host rocks in the Northern Cordillera, 1979-.

216. HALDEN, N.M., Univ. Manitoba (Earth Sciences):

Geochemical traverse of the Thompson mobile belt, northern Manitoba, 1983-84.

To expand geochemical data relating to the Thompson Mobile belt in an effort to amalgamate geochemical constraints with a tectonic synthesis of the region.

217. McNUTT, R.H., McMaster Univ. (Geology):

$^{87}Sr/^{86}Sr$ composition of some brines from the Precambrian Shield of Canada, 1983-.

Twenty-four groundwater samples from seven operating mines at Sudbury, Yellowknife and Thompson, all from depths greater than one kilometre and ranging in total dissolved solids (TDS) from 1900 to 250 000 mg/litre, were measured for their $^{87}Sr/^{86}Sr$ values. Each geographic location gives a limited range in values and each location is distinct from the others. This is interpreted as the result of extensive water-rock interaction on a local scale. For most of the time, these brines were isolated and only recently have been exposed to surface water as a result of the mining operations. The extent of the isolation is shown by the contrasting isotopic values of two "pockets" of water (.711 vs. .716) located on opposite sides of the same fault system on the North Range at Sudbury. The exchange at all sites probably has continued until the present, as indicated by the close agreement between water and present day $^{87}Sr/^{86}Sr$ whole rock values. If so, it suggests that there is no single age for such brines, but it may be possible to date stages in the water's evolution by determining the age of secondary minerals that equilibrated with the water.

218. O'REILLY, G.A., MUECKE, G.K., CHATTERJEE, A.K., CLARKE, D.B., Dalhousie Univ. (Geology), Nova Scotia Dept. Mines and Energy:

Geology and geochemistry of the grantoid rocks of the Eastern Meguma Terrane, Nova Scotia, 1983-85; M.Sc. thesis (O'Reilly).

See:

Geology of the granitoid rocks of the eastern Meguma Terrane of Nova Scotia; Northeastern Section, Geol. Soc. Amer., Abstracts with Programs 1984, vol. 16, no. 1, p. 21, 1984.

Part of ongoing research by the Nova Scotia Department of Mines and Energy in the granitoid rocks of Mainland Nova Scotia. Future research will involve similar projects within the granitoid rocks of the South Mountain batholith.

219. SHAW, D.M., HIGGINS, M.D., McMaster Univ. (Geology):

Boron abundance and distribution in the mantle, 1981-84.

See:

Boron cosmochemistry interpreted from abundances in mantle xenoliths; Nature, vol. 308, p. 172, 1983.

We have established a provisional valve for boron abundance in the mantle using mantle-derived xenoliths. Boron appears to correlate with aluminium in unmetasomatized xenoliths, as would be expected if it is removed when the mantle is depleted by basalt generation. Boron is considerably enhanced in metasomatized xenoliths. This is consistent with the high levels of boron found in kimberlites. Boron in the metasomatized xenoliths cannot be correlated with any other element.

220. SHAW, D.M., TRUSCOTT, M.G., McMaster Univ. (Geology):

Distribution of boron in chert nodules, bedded cherts, and cherts of banded iron formations, and the mobilization of boron during diagenesis of these rocks, 1982-85.

See:

Boron in cherts; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 8, p. A70, 1983.

Distribution of boron in cherts, and effects of diagenesis on mobilization of boron; Geol. Soc. Amer., Abstracts with Programs, vol. 15, p. 708, 1983.

Distribution of boron in cherts has been studied using Prompt Gamma Neutron Activation Analysis (PGNAA) and nuclear track methods to investigate the role of siliceous sedimentary rocks as sinks for oceanic boron and the potential use of these rocks as paleosalinity indicators. Effects of diagenesis on boron abundance and localization were studied in the Monterey Fm. and in Ontario nodular chert. Cherts in banded iron formations are being analyzed to compare environments of chert formation. Analyses of Precambrian marine shales indicate that ancient seawater was likely similar in boron content to Phanerozoic oceans.

Continuing research includes investigation of boron in the Precambrian ocean by studying marine shales, seawater-altered volcanic rocks, and stromatolites, and studies of the distribution of boron as a stratigraphic marker in hydrothermally replaced chert.

New research will focus on the behaviour of boron and other trace elements during the metamorphic processes in the lower crust, using PGNAA, standard whole rock analyses, petrographic studies, and nuclear track methods.

221. SWINDEN, H.S., STRONG, D.F., FRYER, B.J., JENNER, G.A., Memorial Univ. (Earth Sciences):

The nature and setting of some Arenig-Caradocian volcanic rocks in central Newfoundland, 1983-86; Ph.D. thesis (Swinden).

Arenig-Caradocian volcanic sequences in central Newfoundland are commonly interpreted to have formed in an island arc environment. However, little is known of their geochemistry or petrochemistry. This study is a detailed geochemical study of volcanic and subvolcanic rocks from three of these sequences. Major and a large suite of trace elements, including HES and REE, will be analysed and supplemented by Nd and Sr isotope data in order to interpret the nature of the magmatism and place new constraints on the tectonic setting of the volcanic rocks.

222. THORPE, R.I., Geol. Surv. Can.:

Lead isotopic studies on genesis of ore deposits, 1978-.

223. TILLEY, B.J., LONGSTAFFE, F.J., Univ. Alberta (Geology):

The effect of fluid flow on diagenesis and its relation to stratigraphic traps and reservoir quality: Bluesky/Gething formations, deep basin of Alberta, 1983-87; Ph.D. thesis (Tilley).

To evaluate the effect of the flow regime on the trends of clastic diagenesis and develop a geochemical model for burial diagenesis in sedimentary basins with relatively large hydraulic potentials. The focus of the study is on the Bluesky/Gething interval in the Deep Basin of Alberta and in the Peace River Oil Sands area. Specific objectives of the project are: 1) to examine the local effect of fluid flow on diagenesis and its effect on reservoir quality; 2) to evalute the influence of changing fluid regimes on regional diagenetic trends within one formation; 3) to evaluate the influence of changing fluid regimes on burial diagenetic trends; and 4) to geochemically evaluate the extent of cross-formational flow and its affect on diagenesis. Procedures will include core study, thin section, scanning electron microscope, X-ray diffraction and stable isotope analysis, as well as examination of pressure data and chemical analysis of formation waters.

224. TRUSCOTT, M.G., McMaster Univ. (Geology):

Trace element geochemistry and petrogenesis of the alkalic rocks of East Butte, Sweetgrass Hills, Montana, 1982-84.

REE and other trace elements were anlayzed by INAA, XRF, and PGNAA in syenites, granites, and syenitic lamprophyres from East Butte, Sweetgrass Hills, which constitutes the northwestern part of the Petrographic Province of Central Montana as part of a study of crustal processes at McMaster University. The petrogenetic history of this area was determined during doctoral research at the University of Saskatchewan. Recent geochemical studies and magma-mixing computer calculations support the hypothesis that the igneous rocks of East Butte were derived from a parent magma of mafic syenite composition, which became differentiated and tapped off at difference levels. REE compositions were controlled mainly by the removal of apatite and sphene.

225. VILKS, P., KRAMER, J.R., McMaster Univ. (Geology):

Adsorption mechanisms of copper on kaolinite, 1980-84; Ph.D. thesis (Vilks).

Mechanisms of Cu adsorption on kaolinite have been investigated in order to obtain a better insight into the processes of trace metal adsorption on clay minerals. Adsorption kinetics, which have been measured with the help of a specific ion electrode, have revealed the existance of several mechanisms which are responsible for Cu uptake. From an evaluation of kaolinite's structure and chemistry one can predict that potential adsorption mechanisms may include nonspecific coulombic attraction, specific coordination to reactive surface oxygens, induced precipitation, penetration of the clay structure, and concentration of Cu in the interstitial water of clay flocs. Experiments to date have shown that the initial Cu adsorption is controlled by specific coordination to surface oxygens, followed by slower surface precipitation reactions. There is also good evidence that Cu may be concentrated in the interstitial water of clay flocs.

226. WARREN, H.V., Univ. of British Columiba (Geological Sciences):

Biogeochemistry as an auxiliary tool in prospecting, 1981-86.

Preliminary work has established that biogeochemistry may be usefully employed as an auxillary tool in exploring for gold deposits. Further work now proposed involves expanding our investigating to moses, lichens, and more extended studies of pollens.

227. ANDREW, A., GODWIN, C.I., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
Isotopic evolution of lead and strontium in Vancouver Island, British Columbia, 1982-86; Ph.D. thesis (Andrew).

The lead isotopic compositions of about 30 rocks from the Sicker, Karmutsen and Bonanza volcanic suites, and the Catface Tertiary intrusions of Vancovuer Island, are presently being measured. Isotope dilution techniques are being used to determine the concentrations of lead, uranium, and thorium in these rocks. This data, together with existing strontium isotope data will be used to produce an isotope evolution model for Vancouver Island. The rock lead isotope data, in conjunction with numerous galena analyses, will provide useful information on the metallogenesis of the ore deposits of Vancouver Island.

228. ARCHIBALD, D.A., FARRAR, E., Queen's Univ. (Geological Sciences):
Tectonothermal history of the southern Kootenay Arc and Purcell Anticlinorium, southeastern British Columbia, 1976-86.

See:

Geochronology and tectonic implications of magmatism and metamorphism, southern Kootenay Arc and neighbouring regions, southeastern British Columbia. Part I: Jurassic to mid-Cretaceous; Can. J. Earth Sci., vol. 20, p. 1891-1913, 1983.

A study of the geology and geochronology of the southern Kootenay Arc, B.C. (D.A.A., E.F.), is nearing completion. The study comprises conventional K-Ar dating as well as $^{40}Ar/^{39}Ar$, U-Pb (with T. Krogh, R.O.M.) zircon dating and Rb/Sr studies (with R.L. Armstrong) of selected plutons. This study has succeeded in elucidating the thermal and tectonic history of the Kootenay Arc.

Isotopic studies are being continued in selected areas in and bordering the southern and central Kootenay Arc. Samples have been collected from several mid-Cretaceous stocks and batholiths in the Purcell anticlinorium for fission track dating and $^{40}Ar/^{39}Ar$ experiments on K-feldspar. The Precambrian Hellroaring Creek stock and related amphibolite-facies metamorphic rocks have been sampled for a detailed isotopic study (U-Pb zircon, K-Ar, $^{40}Ar/^{39}Ar$ and fission track). It is anticipated that these studies will provide a complete tectonothermal history of the Purcell anticlinorium from Precambrian to Eocene time. A $^{40}Ar/^{39}Ar$ study of dykes in the Irene Volcanics (Windermere Supergroup near 49°N) should complement this study.

229. ARCHIBALD, D.A., FARRAR, E., Queen's Univ. (Geological Sciences):
An $^{40}Ar/^{39}Ar$ study of the Kapuskasing Structural Zone, northern Ontario, 1979-86.

An $^{40}Ar/^{39}Ar$ study of the sheared eastern margin of the KSZ is in progress. Both deformed and undeformed mafic and granitiod rocks records low-grade thermal events (2.2-2.5 Ga, ~1.7 Ga and 1.1 Ga). A regional-scale, isotopic transect of the KSZ and neighbouring regions is planned.

230. ARCHIBALD, D.A., FARRAR, E., Queen's Univ. (Geological Sciences):
A K-Ar and $^{40}Ar/^{39}Ar$ study of metamorphic rocks near the Purcell thrust, southeastern British Columbia, 1983-85.

Samples of amphibolite facies schists near the Purcell Thrust in the Canoe River area were obtained for isotopic study. Biotite-muscovite pairs show a marked reversal of the normal discordance of K-Ar dates suggesting that the biotite contains excess ^{40}Ar. These and other samples from lower grade rocks to the east will be used for $^{40}Ar/^{39}Ar$ step-heating experiments in an effort to establish the timing of faulting in the area, the thermal history of the rocks and to assess the tectonic significance of the reverse discordance of the K-Ar mica dates.

231. ARCHIBALD, D.A., FARRAR, E., CARMICHAEL, D.M., JOURNEAY, J.M., Queen's Univ. (Geological Sciences):
An isotopic study of the west flank of Frenchmen's Cap dome, southeastern British Columbia, 1983-85.

A K-Ar and $^{40}Ar/^{39}Ar$ study of the Frenchman's Cap dome from the core zone to the Amatey pluton, is a progress. K-Ar mica dates fall between 45 and 55 Ma. For mica pairs, the muscovite date is slightly greater than the biotite date. Hornblende has yielded K-Ar dates as great as 100 Ma. $^{40}Ar/^{39}Ar$ step-heating experiments will be done on a selection of these samples to document the tectonothermal history of this area.

232. ARCHIBALD, D.A., FARRAR, E., CLARK, A.H., SEAL, R., Queen's Univ. (Geological Sciences):
A K-Ar and $^{40}Ar/^{39}Ar$ study of the Lake George antimony deposits, southern New Brunswick, 1983-84.

Preliminary K-Ar dates suggest a Silurian age for the mineralization event.

233. ARMSTRONG, R.L., PARRISH, R.R., BROWN, R.L., LANE, L., JOURNEAY, J.M., VAN DER HEYDEN, P., Univ. British Columbia (Geological Sciences), Geol. Surv. Can., Carleton Univ. (Geology):
Omineca belt geochronometry, British Columbia-Yukon, 1975-; Ph.D. theses (Lane, Journeay).

See:

A U-Pb zircon age of the Kuskanax batholith, southeastern British Columbia; Can. J. Earth Sci., vol. 20, p. 1751-1756, 1983.

Early Tertiary resetting of potassium-argon dates in the Kootenay Arc, southeastern British Columbia; ibid., p. 867-872, 1983.

Work is now concentrated on the Columbia River Fault Zone, Frenchman Cap Dome, and Okanagan Valley areas. Other projects are being written up.

234. ARMSTRONG, R.L., ISACHSEN, C.I., Univ. British Columbia (Geological Sciences):
Vancouver Island traverse (Lithoprobe Phase I) geochronometry, British Columbia, 1984.

Ages of major igneous rock units that comprise Vancouver Island will be provided for the Lithoprobe geologic synthesis.

235. ARMSTRONG, R.L., VAN DER HEYDEN, P., Univ. British Columbia (Geological Sciences):
Batholith ages and isotope characteristics across southern Intermontane Belt of British Columbia, 1975-.

See:

Rb-Sr dating of Paleozoic(?), Mesozoic and Cenozoic intrusive rocks, Okanagan Lake region; Can. J. Earth Sci., vol. 20, p. 1579-1585, 1983.

Additional material from Granite Mountain, Takomkane, Thuya, Raft, and Baldy plutons was collected during the summer of 1983, is in process in analytical labs. Material from Nicola and Mount Lytton plutons is also under study.

236. BOWRING, S.A., PADGHAM, W.A., Indian and Northern Affairs Canada (Geol. Div.), Washington Univ.:
Geochronology of the Yellowknife Volcanic belt, Northwest Territories, 1982-.

237. BURWASH, R.A., WAGNER, P.A., Univ. Alberta (Geology):
Relict Archean terrains in the western Churchill Province, 1980-84.

Archean granulites in northeastern Alberta have been dated by Sm-Nd and Rb-Sr methods to establish the times of the two major metamorphic events in this area. The granulite facies event is late Kenoran; its amphibolite overprint early Hudsonian.

238. CHAMBERLAIN, V.E., LAMBERT, R. St. J., Univ. Alberta (Geology):
Geochronology of tonalite gneisses, Bear Province, Northwest Territories, 1983-85.

Zircons from tonalite gneisses east of the Wopmay Fault and south of the Coppermine yield a primary age of 2910 Ma, with Pb-loss in the late Mesozoic.

239. CLARK, G.S., SCOATES, R.F.J., Univ. Manitoba (Earth Sciences), Geol. Surv. Can.:
Age and geological setting of the Fox River Belt, Eastern Churchill-Superior Boundary area, Manitoba, 1980-84.

Rubidium-strontium isotopic ages have been completed on the several lithologic units from the Fox River Belt and adjacent Kisseynew paragneiss of the Churchill Province and granulite of the Superior Province to the south. A late Aphebian age is suggested for intrusion of the Fox River Sill based on ages of associated mafic volcanics and metasedimentary rocks. The metasedimentary unit within the belt has a high $^{87}Sr/^{86}Sr$ initial ratio, contrasting sharply with the Kisseynew paragneiss (0.7035-0.7040). The results place restrictions on the models proposed for the evolution of this part of the Superior-Churchill Boundry area.

240. CLARK, G.S., WEBER, W., Univ. Manitoba (Earth Sciences):
Genesis of late Archean uraniferous granite in the Molson Lake-Kalliechahoolie Lake area, northwest Superior province, Manitoba: Rb-Sr isotopic evidence, 1982-84.

Several granite intrusions (2500 Ma) occur within older granitic terrain (about 2700 Ma) throughout this area. The younger granites contain anomalous uranium concentrations and the Rb-Sr isotopic systematics suggest an igneous origin consistent with partial melting of the older granitic basement.

241. CONNARE, K.M., McNUTT, R.H., McMaster Univ. (Geology):
Rb-Sr geochronology, geochemistry and petrography of some high grade gneisses found near Parry Sound, Ontario, 1981-84; M.Sc. thesis (Connare).

Two high grade orthogneisses from the Parry Sound and Britt Domains of the Ontario Gneiss Segment in the Grenville Province have been dated by the Rb-Sr whole rock method. The felsic, amphibolite grade Nobel Gneiss is composed of quartz, microcline, plagioclase hornblende, biotite and trace amounts of sphene, apatite and zircon. It gives an age of 1330 ± 44 m.y. with an initial Sr ratio of .7033 ± 17 and a MSWD of 1.67. This age is interpreted as the time of intrusion. The second rock type, the mafic granulite grade McKellar Gneiss is composed of plagioclase (An_{65}), orthopyroxene, clinopyroxene, quartz, hornblende, potassium feldspar, opaque, biotite and trace amounts of apatite. The potassium feldspar occurs as perthite and some of the labradorite is antiperthitic. Some of the hornblende and biotite occur after orthopyroxene and opaques respectively. The McKellar Gneiss gives an age of 1241 ± 12 with an initial Sr ratio of .7034 ± 1 and a MSWD of 2.23. This age is tentatively interpreted as the time of granulite grade metamorphism. Primary geochemical analysis of retrograded McKellar Gneiss adjacent to a shear zone indicates introduction of water and little or no loss or gain of any major elements.

242. CORMIER, R.F., Saint Francis Xavier Univ. (Geology):
Rb/Sr dating of acid volcanic rocks from the Fisset Brook Formation and the Fountain Lake Group, Cape Breton and northern Nova Scotia, 1982-84.

243. EASTON, R.M., DRESSLER, B.O., WOOD, J., CORFU, F., KROGH, T.E., DAVIS, D., Ontario Geol. Surv.:
Isotopic age compilation map of Ontario, 1983-84.

See:

Radiometric age compilation map of the Grenville Province: Ontario, Quebec, New York and Newfoundland/Labrador; Geol. Assoc. Can.-Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 59, 1984.

Radiometric age compilation map of Northern Ontario; ibid., p. 59, 1984.

To compile all published geochronologic data for the Province of Ontario older than 10 million years, correct data to 1977 IUGS constants, establish a computerized data base for the data, and publish the compilation at 1:1 000 000 scale for the province. Data collection completed, production of maps underway. Expected availability late 1984. Project will update data base and maps at regular intervals.

244. FARRAR, E., ARCHIBALD, D.A., CLARK, A.H., Queen's Univ. (Geological Sciences):
Ages of tin and tungsten mineralization, Korea, 1979-85.

A K-Ar study (D.A.A., E.F.) of slected Sn and W mining districts in Korea has been initiated. K-Ar dates (80 to 1700 Ma) and $^{40}Ar/^{39}Ar$ age spectra suggest a complex thermal history for these areas.

245. FRANCE, L., FARRAR, E., CLARK, A.H., ARCHIBALD, D.A., Queen's Univ. (Geological Sciences):
An isotopic and LANDSAT investigation of landform development in Neogene volcanic rocks of southern Peru, 1983-85; M.Sc. thesis (France).

Preliminary K-Ar dating of Neogene volcanic rocks from four transects of S. Peru has delineated several episodes of volcanic activity (23, 16, 11, <1 Ma). These dates will be used to bracket the age of major unconformities. Landsat images of these areas will be used to map the distribution of the volcanics and a regional study of the geochemistry is also planned.

246. GHOSH, D., LAMBERT, R.St.J., HOLLAND, J.G., Univ. Alberta (Geology):
Isotopic studies of the Roseland Arc and adjacent complexes, 1980-85; Ph.D. thesis (Ghosh).

All igneous complexes in the region have suffered severe Sr metasomatism connected with hydrothermal alteration processes. The more reliable Sr isotope data, allied with whole-rock Pb, indicate minimal continental crustal contamination in the batholiths west of Kootenay Lake. The sediments in the region become progressively more isotopically mantle-like with time, with the switch-over from continental to oceanic derivation occurring at the Milford Group. The Pb ores of the district have Pb isotopes which are almost invariably directly linked to the host rocks. Zircon data indicate Jurassic and Tertiary intrusive events in the Nelson batholith.

247. HEAMAN, L.M., McNUTT, R.H., SHAW, D.M., McMaster Univ. (Geology):
Rb-Sr whole rock and U-Pb zircon systematics of high grade metamorphic rocks, Grenville Province, Ontario, 1980-84; Ph.D. thesis (Heaman).

To evaluate the behaviour of the Rb-Sr and U-Pb zircon systems in highly deformed rocks and to unravel the timing of igneous activity in the Central Metasedimentary Belt (CMB) of the Grenville Province, Ontario. The ability to obtain meaningful Rb-Sr whole rock age data from deformed rocks depends entirely on the sampling approach. In this study, samples collected on a regional scale produce spurious age data whereas samples collected from individual outcrops record meaningful geological ages. Thin slabs cut from individual samples often record the time of metamorphism. A summary of the age dates obtained on granitoid rocks from the CMB indicate major peaks of igneous activity circa 1250, 1100 and 1050 Ma ago. Some of the 1100 Ma granitoids have high initial strontium ratios (i.e. >0.706) indicating crustal reworking during the main phase of Grenville deformation.

248. HICKSON, C., ARMSTRONG, R.L., SOUTHER, J., HARAKAL, J., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Cordilleran Cenozoic volcanic rocks-age and petrology, British Columbia, 1975-; Ph.D. thesis (Hickson).

K-Ar dating and petrology of volcanic centers of the Anahim hot spot trace is the major current activity.

249. HUNTLEY, D.J., BERGER, G.W., Simon Fraser Univ. (Physics):
Thermoluminescence dating of sediments, 1975-.

See:

Thermoluminescence dating of sediments; PACT, vol. 9, p. 607-6189, 1983.

Dating volcanic ash by thermoluminescence; PACT, vol. 9, p. 581-592, 1983.

Analysis of thermoluminescence data dominated by second order kinetics; Physics Status Solidi, vol. 79, p. 251-261, 1983.

To establish thermoluminescence dating as a viable means of dating sediments, and to determine under what circumstances it can be used. Much progress has been made in showing that the R-gamma method gives correct results in some circumstances, and that it is the best of the currently proposed methods. In particular it gave correct results for a C-14 dated shallow marine gulf core, some glaciolacustrine silts, and some paleosols. Conventional TL dating has also been shown to be successful in dating the glass portion of tephra layers.

250. KONTAK, D.J., FARRAR, E., CLARK, A.H., Queen's Univ. (Geological Sciences):
The geological history of the Cordillera Carabaya District of southeastern Peru: magmatic and metallogenetic processes in an ensialic environment, 1979-84; PH.D. thesis (Kontak).

Investigations into the tectonic, magmatic and metallogenic evolution of the Cordillera Carabay, southeastern Peru (D.J.K., E.F.) have revealed a close temporal and spatial relationship between Sn-W-base metal mineralization and specific magmatic and tectonic events. The combination of K-Ar and $^{40}Ar/^{39}Ar$ geochronology (100 new dates), petrology, geochemistry (170 whole rock analyses), and ore deposit studies has permitted the development of a tectonic model to explain the distribution of rock types and ore deposits with respect to the surrounding Andean system.

A literature review combined with new K-Ar dates (E.F.) has permitted the time - space relationships of major alkalic volcanic centers of South Island, New Zealand, and the Campbell Plateau to be established. The observed relationship has been ascribed to the overriding of the Indian-Antarctic ridge of the Pacific Plate.

251. MARMONT, S., COLVINE, A.C., Ontario Geol. Surv.:
Applications of age dating to gold mineralization, 1983-86.

To apply the age dating methods to better understand the sequence of events in mineralization process, specifically gold. The U-Pb Zircon technique developed and used at the Jack Satterley Laboratory, Royal Ontario Museum, is the chief method used at this stage. However progress is being made to employ other reliable techniques such as $^{40}Ar/^{39}Ar$ through cooperation with the Physics Department of University of Toronto.

252. MATHEWS, W.H., Univ. British Columbia (Geological Sciences):
Plateau basalts of the interior of British Columbia, 1983-.

To determine regional pattern and timing of volcanism in the Miocene and younger history of the interior of British Columbia and subsequent geomorphic and tectonic developments.

253. PRIDE, M.J., CLARK, G.S., Univ. Manitoba (Earth Sciences):
Rb-Sr systematics of a rhyolite plug in the Mount Skukum sedimentary-volcanic complex, Whitehorse map area, Yukon, 1983-84; PH.D. thesis (Pride).

Rubidium-strontium whole-rock data for a Sr-depleted suite of samples from a rhyolite plug within the Mt. Skukum complex generate a well-defined isochron age of 53.7 ± 1.3 Ma (1σ error). The initial $^{87}Sr/^{86}Sr$ ratio of 0.7049 does not suggest a significant crustal component as having affected the composition of these highly fractionated rhyolites.

254. SMITH, A., LAMBERT, R.St.J., Univ. Alberta (Geology):
Nd isotope studies of the southern Intermontane Belt, British Columbia, 1982-86; Ph.D. thesis (Smith).

All Tertiary rocks so far examined have come from highly depeleted mantle, whether xenoliths, tholeiites or alkali basalts. The isotopic patterns exhibited do not, however, correspond to the usual MORB pattern and must involve a depleted source which with unusually low Rb-Sr or high Sm/Nd or both.

255. SUN, M., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences):
Isotopic study of ultramafic nodules, British Columbia, 1983-84; M.Sc. thesis (Sun).

An isotopic study of ultramafic xenoliths contained in Tertiary basalts erupted at several locations in B.C. has begun. Rb-Sr analyses will be followed later by Pb and possibly Nd isotopic analyses.

256. VAN BREEMEN, O., Geol. Surv. Can.:
Isotopic age determinations and radiogenic trace element studies of rocks and minerals, 1983-.

257. VAN DER HEYDEN, P., ARMSTRONG, R.L., WOODSWORTH, G.J., PARRISH, R.R., SCOTT, K.L., HILL, M.L., Univ. British Columbia (Geological Sciences), Geol. Surv. Can., Princeton Univ.:
Coast Plutonic belt geochronometry, British Columbia, 1975-; PH.D. theses (van der Heyden, Hill).

See:

Cenozoic thermal evolution and tectonics of the Coast Mountains of British Columbia; Tectonics, vol. 2, p. 601-631, 1983.

Uranium-lead dates from the Central Gneiss Complex and Ecstall pluton; Can. J. Earth Sci., vol. 20, p. 1475-1483, 1983.

Dating of Coast Plutonic Complex plutons and enclosing gneisses continues, with most effort directed to U-Pb dating of zircons. Work in Whitesail Lake map area largely complete. Alice Arm, Bella Coola, Vancouver-Pemberton traverses are in progress.

258. VAN SCHMUS, W.R., BOWRING, S.A., Univ. Kansas (Geology):
Geology and geochronology of Wopmay Orogen, Northwest Territories, Canada, 1979-84; PH.D. thesis (Bowring).

See:

Continental intra-arc depressions: A nonextensional model for their origin, with a Proterozoic example from Wopmay Orogen; Geology, vol. 12, p. 73-77, 1984.

Short-lived 1.9 Ga continental margin and its destruction, Wopmay Orogen, northwest Canada; Geology, vol. 12, p. 68-72, 1984.

259. CHUNG, C.F., Geol. Surv. Can.:
Development of computer-based statistical techniques applicable to regional geological and mineral deposit data, 1975-.

260. CROWE, A.S., LONGSTAFFE, F.J., Univ. Alberta (Geology):
Numerical modelling of clastic diagenesis, 1983-85; Ph.D. thesis (Crowe).

Essentially all diagenetic studies to date are based on conceptual models, that is, models supported by descriptions and interpretations. What is lacking in this field is the development of modelling techniques that can be used to describe and understand diagenetic processes. The research currently being undertaken investigates the formation of authigenic minerals in clastic sedimentary basins due to the influx of meteoric waters mixing with formation fluids. Theoretical aspects of the project focus on the development of computer based techniques to model the mixing of waters and the evolution of mineral assemblages and fluid composition in these basins. Of particular interest is the formation and alteration of clays. The model is designed to examine the role of various geological, chemical and hydrodynamic parameters in controlling the mineralogy of the basin. Specific parameters to be studied include temperature, pressure, fluid composition, fluid flow rates and permeability. From a practical viewpoint, the research will provide valuable insight into the formation and degradation of groundwater aquifers and petroleum reservoirs.

261. MacGILLIVRAY, J.R., HAMILTON, W.N., Alberta Research Council (Geol. Surv.):
Information geology, 1974-.

GEODIAL now includes most published and unpublished geoscience reports of Alberta Research Council (to end of 1983), the complete works of Canadian Society of Petroleum Geologists (to end of 1983), published and unpublished reports of the Geological Survey of Canada that pertain to Alberta (to end of 1980), theses pertaining to Alberta, and much of the relevant serial literature.

262. TESKEY, D.J., Geol. Surv. Can.:
Development of regional geophysical data processing and interpretation methods, 1982-.

GEOMATHEMATICS/MATHEMATIQUE DE LA TERRE

263. AGTERBERG, F.P., Geol. Surv. Can.:
Probability models for estimating mineral potential and geoprocessing, 1969-.

See:

Statistical analysis of granite pore size distribution data, Lac du Bonnet batholith, eastern Manitoba; Geol. Surv. Can., Paper 84-1A, p. 29-38, 1984.

264. AGTERBERG, F.P., Geol. Surv. Can.:
Mineral and energy resource evaluation; probabalistic methods, 1976-.

265. BONHAM-CARTER, G.F., Geol. Surv. Can.:
Geomathematical applications in the integration of geoscience map data, 1983-.

266. FABBRI, A.G., Geol. Surv. Can.:
Quantification of geological variables and geomathematical estimation of mineral potential, 1972-.

267. SINCLAIR, A.J., GIROUX, G.H., TILKOV, M., Univ. British Columbia (Geological Sciences):
Geostatistics and geomathematics applied to exploration models and evaluation of mineral deposits in British Columbia; M.A.Sc. thesis (Tilkov).

See:

A preliminary assessment of Zeballos mining camp; British Columbia Ministry of Energy, Mines, Petrol. Res., Paper 1984-1, p. 219-232, 1984.

A preliminary report on resource estimation using gridded geological data: Gulchon Creek batholith; ibid., p. 233-239, 1984.

To integrate geological information in a quantitative way into resource evaluation, exploration modelling and mineral deposit evaluation.

GEOMORPHOLOGY/GÉOMORPHOLOGIE

268. DEWEZ, V., GEURTS, M.A., Univ. Ottawa (Géographie):
Extension de la dernière glaciation, origine des glaces et conditions de déglaciation de la chaîne Ruby, Yukon, 1981-85; thèse de doctorate (Dewez).

La Chaîne Ruby constitue la zone médiane de deux longues glaciaires distinctes. L'analyse minéralogique des dépôts situés à différents point clés de la chaîne ainsi que l'étude morphologique des dépôts permettront d'établir origine et extension de ces deux lobes durant la dernière glaciation. Un intérêt particulier est accordé aux dépôts de déglaciation, dont l'agencement dans le paysage indiquent des conditions particulières de retrait.

269. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Bibliographie sur les caractéristiques physiques des Cantons de l'Est, Québec, 1971-.

Voir:

Bibliographie sur les caractéristiques physiques des Cantons de l'Est, Québec, Canada; supplément no. 6; Département de géographie, Univ. Sherbrooke, Bulletin de recherche no. 69, 1983.

Un 8è rapport est prévu en 1985.

270. DUBOIS, J.M.M., LESSARD, G., Univ. Sherbrooke (Géographie):
Géomorphologie, télédétection et évolution littorale de la Côte Nord du Saint-Laurent, 1976-84.

Voir:

Geomprohology and coastal sensitivity to oil spills in the Gulf of Saint Lawrence; Réunion annuelle de l'Association canadienne des géographes, abstracts, p. 13, 1983.

Projet d'évolution des littoraux du golfe du Saint-Laurent: les tempêtes et l'érosion des côtes; Canadian Geography no. 2, Saint Mary's University, Halifax, p. 103-116, 1983.

271. FORBES, D.L., Geol. Surv. Can.:
Morphology, sedimentology, and dynamics of Newfoundland coast, 1981-.

272. FRENCH, H.M., POLLARD, W.H., Univ. Ottawa (Geography):
Permafrost and ground ice investigations, interior northern Yukon, Canada, 1983-84.

273. GEURTS, M.A., DEWEZ, V., Univ. Ottawa (Géographie):
Répartition de la cendre volcanique White River et son impact sur la végétation (Sud Ouest Yukon), 1983-84.

Les analyses multivariées basées sur la théorie de l'information révèlent que la végétation est un des facteurs primordiaux pour la conversation de la cendre White River daté de 1230 BP dans les zones marginales de son dépôt Sud Ouest du Yukon. Des analyses polliniques montrent que le saupoudrage de la White River Ash à affecté la végétation et tout particulièrement la toundra herbacée.

274. GILBERT, R., McKENNA NEUMAN, C., GLEW, J., HORVATH, V., Queen's Univ. (Geography):
Glaciomarine sedimentary environments of fiords on Baffin Island, Northwest Territories,, 1977-; Ph.D. theses (McKenna Neuman, Glew), M.Sc. thesis (Horvath).

See:

Contemporary sedimentary environments on Baffin Island: Reconnaissance of lakes on Cumberland Peninsula; Arctic and Alpine Res., vol. 15, p. 321-322, 1983.

Sedimentary processes of Canadian arctic fiords; Sedimentary Geol., vol. 36, p. 147-175, 1983.

Geophysical studies based on conventional shallow and Huntec high resolution seismic surveys of fiords on Baffin Island; in Sedimentology of Arctic Fiords Experiment, HU 82-031, vol. 1, Canadian Data Rept., Hydrographic Sci., no. 12, p. 15-1 to 15-92, 1983.

A shallow seismic survey on the intertidal flats at Pangnirtung, Baffin Island, Northwest Territories; Geol. Surv. Can., Paper 83-1B, p. 273-277, 1983.

275. JOHNSON, P.G., Univ. Ottawa (Geography):
The formation of rock glaciers by high magnitude low frequency processes, Yukon, 1979-.

See:

Rock glaciers. A case for a change in nomenclature; Geografiska Annaler, vol. 65A, p. 27-34, 1983.

Rock Glaciers are the morphological expressions of a range of processes on slopes of recently deglaciated areas. A basic division between glacier debris systems and talus/rock collapse systems is made. The glacier debris system forms are produced by glacier ice deformation beneath a debris cover. Talus/rock collapse forms are produced by a range of mechanisms from creep due to interstitial ice content, through release of talus instabilities after deglaciation, to rock collapse. They represent a suite of different environment conditions through the late Pleistocene and Holocene and the determination of these conditions is the basis of a palaeoclimatic project.

276. JOHNSON, P.G., KODYBKA, R.J., CAMPBELL, I., Univ. Ottawa (Geography):
Holocene evolution of the landscape of the St. Elias Mountains and the Ruby Range of southwestern Yukon, 1983-.

See:

Problems of Quaternary glacial correlation due to regional ice/local ice interactions, Ruby Range, southwest Yukon, Proc. York Symp., 1983.

Holocene glaciological conditions, southwest Yukon; Dept. Geography, Univ. Ottawa, Res. Note 44, 1983.

Glaciological conditions and geomorphological interpretation; Dept. Geography, Univ. Ottawa, Res. Note 43, 1983.

Sections found in the northern Ruby Range in Talbot, Alaskite and Rockslide Creeks contain a record of the mid to late Pleistocene. The samples are still in process of analysis but a date of 3 800 yrs B.P. for organics at 120 km in lacustrine deposits in Talbot Creek give promise of a more extensive Holocene record in the permafrost below the area sampled.

277. KODYBKA, R.J., JOHNSON, P.G., Univ. Ottawa (Geography):
Trace element analysis and other provenance related studies in determining glaciological conditions during the Pleistocene and Holocene in the Ruby Range, southwest Yukon Territory, 1982-84; Ph.D. thesis (Kodybka).

See:

Problems of Quaternary glacial correlation due to regional ice/local ice interactions, Ruby Range, southwest Yukon; Proc. York Symp. 1983.

Involves the examination of surficial deposits with the use of trace element analysis and other provenance related studies to determine the glaciological conditions during the Pleistocene and Holocene in the Ruby Range, southwest Yukon Territory. The use of trace element analysis and other provenance related studies (erratics, boulder tracing, etc.) have for the most part been exploratory. These techniques have been widely used in those areas of Canada affected by the Laurentide Ice Sheet which by its sheer magnitude included areas of varied terrain as well as dynamic glaciological conditions. The application of these techniques have in the past proven invaluable in determining ice dispersal centres, conditions, as well as processes and rates of erosion. It is believed that the distribution of trace elements and other provenance indicators within the surficial deposits of the Ruby Range will demonstrate the dynamic nature of ice flow conditions in and across this region. The primary aims for followup work include:

1) identify, map and describe morphology forms which can be further examined for provenance study; 2) sample morphological forms with the goal of identifying materials which can be used in trace element analysis; and 3) to establish a more detailed knowledge of local bedrock variations.

278. POLLARD, W.H., FRENCH, H.M., Univ. Ottawa (Geography):
A study of seasonal frost mounds, North Fork Pass, interior northern Yukon Territory, 1979-83; PH.D. thesis (Pollard).

See:

Seasonal frost mound occurrence, North Fork Pass, Ogilvie Mountains, northern Yukon, Canada; Proc. Fourth Internat. Conf. on Permafrost, Fairbanks, Alaska, National Academy Press, p. 1000-1004, 1984.

279. PROVENCHER, L., Univ. Sherbrooke (Géographie):
Caractéristiques biophysiques de la réserve Frontenac, Cantons de l'Est, Québec, 1980-85.

280. SCHWARTZBURG, R., JOHNSON, P.G., Univ. Ottawa (Geography):
Geomorphological implications of the physical limnology of an alpine lake, Yukon, 1981-84; M.A. thesis (Schwartzburg).

The physical limnological characteristics and hydrochemistry of an alpine lake were monitored from breakup till late summer as part of the hydrological assessment of a subarctic/alpine basin. Conditions in the lake do not conform to accepted concepts of Arctic lakes, permafrost conditions persist below the lake throughout the year but groundwater movement appears to be a major component of the water balance of the area.

281. SMITH, R., JOHNSON, P.G., Univ. Ottawa (Geography):
Landform influence on hydrological regime and hydrochemical loading, Yukon, 1981-84; M.A. thesis (Smith).

The role of atmospheric processes, geology and soils in control of hydrochemical loadings have been widely investigated but the influence of landforms and their structural characteristics have received little attention. This work attempts to illustrate the importance of the geomorphology to the hydrological and hydrochemical regimes. Major subsurface loss of water from the study basin is proposed from an analysis of input and output parameters.

GEOPHYSICS/GÉOPHYSIQUE

ELECTRICAL/MÉTHODES ÉLECTRIQUES

282. BARLOW, R.B., PITCHER, D.H., Ontario Geol. Surv.:
Night Hawk geophysical test range, Ontario, 1981-.

See:

Night Hawk geophysical test range results, Night Hawk Lake, District of Cochrane; Ontario Geol. Surv., Misc. Paper 116, p. 132-141, 1983.

During the 1983 summer field season, survey activity and experimentation continued on the Night Hawk geophysical test range near Timmins, Ontario. Several new techniques were applied specifically to help resolve conductors in close proximity, with encouraging results. The Night Hawk grid was extended 300 m east for the purpose of acquiring survey coverage over the eastern extension of the conductive zones outlined to date. A line traversing the midpoint of the conductive zones was widened to permit accurate navigation by airborne systems. In addition, an alternate test range in Sheraton Township has been prepared for survey work in the future. At least 3 known conductors in this area are covered by the new grid system.

283. BAZINET, R., CHOUTEAU, M., École Polytechnique (Génie minéral), IREM:
Etude géotectonique, par magnétotellurique de la ceinture volcanique de l'Abitibi, Québec, 1983-84.

Essayer de déterminer l'origine structurale des "lourds" gravimétriques observés en Abitibi. Obtenir des informations sur la structure profonde de la croûte terrestre dans le but d'isoler les régions présentant un intérêt minier.

284. BAZINET, R., LEGAULT, J., CHOUTEAU, M., École Polytechnique (Génie minéral):
Scalar audio magnetotelluric survey, A.E.C.L. test site, Atikokan, Ontario, 1983.

Essai de la magnétotellurique scolaire comme outil d'évaluation d'un site d'enfouissement des déchets nucléaires. Nous avons démontre que nous pouvons localiser les fissures ouvertes avec précision.

285. BAZINET, R., TRUDEL, P., École Polytechnique (Génie minéral):
Evaluation du potentiel minéral des grands axes structuraux relevés par la méthode INPUT, 1983-85.

Evaluer les différentes méthodes d'exploration susceptibles d'isoler des gisements économiques dans des conducteurs structuraux de grande dimension relevés en Abitibi par la méthode Input.

286. BROWN, R.J., Univ. Calgary (Geology and Geophysics):
Multifrequency IP, inductive coupling therein and models thereof, 1983-.

To develop new, physically sound models for the inductive coupling mutual impedance in multifrequency IP. The subsurface has been modelled as a single loop which leads to a theoretical form for the EM-coupling mutual impedance which contains the Cole-Cole model as a special case. Under consideration are: more complex physical models, the electrochemistry of IP and transformations of mathematical models to the time domain.

287. DYCK, A.V., Geol. Surv. Can.:
Borehole geophysics (electrical and magnetic techniques), 1974-.

288. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique héliporté - Région de Thetford, Québec, 1983-84.

Levé électromagnétique de type Rexhem III pour parfaire les connaissances géologiques et activer l'exploration minière dans deux sous-régions près de Thetford-Mines.

289. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique INPUT - Lac Troilus-Frotet, Québec, 1983-85.

Levé électromagnétique de type "INPUT" pour parfaire les connaissances géologiques et activer l'exploration minière dans la région de l'Abitibi (Lac Troilus-Frotet).

290. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique et spectro-magnétique au sud-est de la Fosse du Labrador, Québec, 1983-84.

Levé électromagnétique de type Rexhem III pour parfaire les connaissances géologiques et activer l'exploration minière dans la Fosse du Labrador.

291. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique INPUT – Région au nord de Schefferville, Québec, 1983-85.

Levé électromagnétique de type "INPUT" pour parfaire les connaissances géologiques et activer l'exploration minière dans la Fosse du Labrador.

292. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique INPUT – Région de Quénonisca, Québec, 1983-85.

Levé électromagnétique de type "INPUT" pour parfaire les connaissances géologiques et activer l'exploration minière en Abitibi dans la région de Quénonisca.

293. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique INPUT – Région de Wetetnagami, Québec, 1983-85.

Levé électromagnétique de type "INPUT" pour parfaire les connaissances géologiques et activer l'exploration minière en Abibiti dans la région de Wetetnagami.

294. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique – Région au nord de Schefferville, Québec, 1983-85.

Levé électromagnétique de type Rexhem III pour parfaire les connaissances géologiques et activer l'exploration minière dans la fosse du Labrador.

295. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique – Région de Johan-Beetz, Québec, 1983-85.

Levé électromagnétique de type Rexhem III pour parfaire les connaissances géologiques et activer l'exploration minière dans la région de la Côte Nord.

296. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé électromagnétique – Région de l'Estrie, Québec, 1983-85.

Levé électromagnétique de type Rexhem III pour parfaire les connaissances géologiques et activer l'exploration minière dans 4 sous-régions de l'Estrie.

297. LEFEBVRE, D.L., BAZINET, R., TRUDEL, P., Québec Ministère Énergie et Ressources:
Evaluation du potentiel minéral des grands axes structuraux relevés en Abitibi par la méthode INPUT, 1983-84.

Par l'étude de plusieurs méthodes géophysiques et géochimiques développer des outils qui vont permettre d'explorer efficacement les grands conducteurs.

298. LEGAULT, J., BAZINET, R., École Polytechnique (Génie minéral):
Étude d'un profil magnétotellurique à travers la ceinture volcanique de l'Abitibi, Québec, 1982-84; M.Sc.A. (Legault).

299. SINHA, A.K., Geol. Surv. Can.:
Evaluation of two deep sounding E.M. systems, 1981-.

300. VALLÉE, M., BAZINET, R., École Polytechnique (Génie minéral):
Magnétotellurique haute fréquence, 1982-84; thèse de doctorat (Vallée).

EXPLORATION/PROSPECTION

301. ANDERSON, N.L., BROWN, R.J., Univ. Calgary (Geology and Geophysics):
Seismic interpretation of western Canadian carbonate buildups, 1982-84; Ph.D. thesis (Anderson).

The diagnostic seismic signatures of western Canadian Devonian reefs are being studied. Data donated by a number of companies has been reprocessed to improve the quality and especially to achieve a uniformity of processing for a large body of data. The object is an integrated geophysical and geological analysis of the seismic and well-log data, a documentation of the characteristic seismic signatures of about 12 different reef types and the construction of carbonate-buildup velocity/density structure models.

302. BURKE, K.B.S., CHANDRA, J., Univ. New Brunswick (Geology), New Brunswick Dept. Nat. Res. (Geol. Surv. Br.):
Gravity and magnetic studies of the 1982 Miramichi earthquake epicentral area, New Brunswick, 1982-83.

A 9 km x 6 km area around the epicentral zone of the 1982 Miramichi earthquakes has been covered by a gravity survey at station spacings varying 0.5 to 2 kms. 200 samples have been collected for density determinations and in situ magnetic susceptibility measurements made at the major outcrops in the area. Interpretation of the gravity results and aeromagnetic data is in progress to provide constraints on the subsurface models used in explaining the seismotectonics of this region of central New Brunswick.

Modelling of gravity anomalies in the epicentral area of the Miramichi earthquakes shows that the North Pole Stream Pluton Granite extends to a depth of 8 km and has its edges covered by a relatively thin wedge (0-1 km) of metasedimentary and older plutonic rocks. Since nearly all of the reported aftershocks are represented by focal depths in the 1-7 km range, it is concluded that the earthquake activity is confined to the pluton. Small diorite bodies with areal extents of a few square kms and thicknesses of 1-2 km occur within the granitic rocks of the pluton, but do not appear to be related spatially to the earthquakes. The heteregeneous nature of the granitic pluton is confirmed by magnetic and radiometric data. A VLF/EM conductor in the area was trenched and found to caused by a highly weathered fault zone with a trend of 140°.

303. CHARBONNEAU, B.W., Geol. Surv. Can.:
Evaluation of uranium reconnaissance data, 1976-.

304. DUCKWORTH, K., Univ. Calgary (Geology and Geophysics):
An investigation of the electrical and electromagnetic responses of hydrocarbon deposits in Western Canada, 1983-85.

See:

Electrical surveys in the Alberta Foothills; CSEG J., vol. 19, no. 1, p. 57-66, 1983.

305. GRASTY, R.L., Geol. Surv. Can.:
Gamma-ray spectrometry (technique development), 1972-.

See:

Radioactive equilibrium studies on four Canadian uranium reference ores; Geol. Surv. Can., Paper 84-1A, p. 53-56, 1984.

306. MACNAB, R.F., Geol. Surv. Can.:
East Coast offshore surveys, 1973-.

See:

SHIPAC: a software package for the ship-board processing of marine geophysial survey data; Geol. Surv. Can., Paper 83-1B, p. 327-330, 1983.

Canadian East Coast multiparameter surveys, 1983; ibid., p. 331-334, 1983.

A gravity map of the Canadian east coast offshore: a demonstration of computer techniques for the construction of regional contour maps from large data sets; ibid., p. 429-431, 1983.

GEOMAGNETISM-PALEOMAGNETISM/ GÉOMAGNÉTISME-PALÉOMAGNÉTISME

307. BARLOW, R.B., Ontario Geol. Surv.:
Commercial aeromagnetic gradiometer system, 1981-84.

See:

Test surveys and developments in areomagnetic gradiometry; Ontario Geol. Surv., Misc. Paper 116, p. 142-144, 1983.

Both the development and data acquisition stages of a contract to test-fly a commercial aeromagnetic gradiometer have been completed by Kenting Earth Sciences Limited of Ottawa. Approximately 19 000 line km of aeromagnetic data were acquired in September and October of 1983 in south-eastern Ontario. A number of system tests were conducted in August for the purpose of benchmarking the signal-to-noise characteristics and the effectiveness of the compensation system. The results were impressive and demonstrated that the aeromagnetic gradiometer is now ready for commercial service.

308. BOWER, M.E., Geol. Surv. Can.:
Ocean aeromagnetics, 1965-.

309. BUCHAN, K.L., Geol. Surv. Can.:
Vertical movements of the Precambrian Shield, 1980-.

310. BUCHAN, K.L., Geol. Surv. Can.:
Paleomagnetism of Nipissing diabase and Abitibi dykes, Ontario and Quebec, 1982-.

311. CHRISTIE, K.W., Geol. Surv. Can.:
Paleomagnetism and rock magnetism instrumentation and technological development, 1970-.

312. CHRISTIE, K.W., Geol. Surv. Can.:
Paleomagnetism of the Hopedale diabase dykes, 1972-.

313. CURRIE, R.G., Geol. Surv. Can.:
Marine magnetic surveys, Pacific margin, 1980-.

314. DEUTSCH, E.R., Memorial Univ. (Earth Sciences):
Lower Paleozoic paleomagnetism in western Ireland, 1983-85.

See:

Mid-Ordovician paleomagnetism and the Proto-Atlantic ocean in Ireland; Amer. Geophys. Union, Geodynamics ser., vol. 12, p. 116-119, 1984.

This new project is part of a continuing paleomagnetic program in the Irish Caledonides. It succeeds the project: "Mid-Ordovician Paleomagnetism and the Extent of the Proto-Atlantic Ocean", which was reported last year. Two hundred oriented samples of volcanic and sedimentary rocks of Lower and mid-Ordovician and Lower Silurian age were collected at 40 sites in the Tourmakeady-Glensaul inlier, Sheeffry Hills and Finney areas in Mayo and Galway Counties, western Eire. These rocks form synclinal structures amenable to a fold test. Laboratory studies so far show that at many

Tourmakeady and Finney sites the magnetization is stable to alternating-field and thermal demagnetization. This experimental work is continuing. Paleomagnetic comparisons with southeastern Irish and British localities may tell whether 1) the wide Proto-Atlantic ocean previously inferred from mid-Ordovician rocks in NW and SE Ireland can be traced to the Early Ordovician, 2) the ocean had partly or fully closed by the early Silurian, and 3) the Tourmakeady-Glensaul arc is primary.

315. FAHRIG, W.F., Geol. Surv. Can.:
Paleomagnetism of the dykes of west Greenland, 1972-.

316. FAHRIG, W.F., Geol. Surv. Can.:
Paleomagnetism of Proterozoic to Devonian strata across Boothia Arch, 1974-.

317. HODYCH, J.P., PATZOLD, R.R., BUCHAN, K.L., Memorial Univ. (Earth Sciences):
Paleomagnetism and mechanism of remanence acquisition in Paleozoic red beds of Appalachians, 1981-86.

See:

Paleomagnetic dating of the transformation of oolitic goethite to hematite in iron ore; Can. J. Earth Sci., vol. 21, p. 127-130, 1984.

To understand mechanism of remanence acquisition in red beds. In particular, wish to relate timing of remanence acquisition to diagenetic history of rock. For example (Hodych et al., 1984), have shown that oolitic hematite ores from Southern Appalachians acquired CRM ~130 million years after deposition but before folding. Here, chemical remanent magnetization (CRM) shown to be very likely due to deep burial heating during the deep-burial phase of diagenesis. Concentrating on Paleozoic red beds from the Appalachians.

318. KNAPPERS, W.A., Geol. Surv. Can.:
Aeromagnetic survey: Labrador and Labrador Continental Margin, 1981-.

319. LANGRIDGE, R., FARRAR, E., CLARK, A.H., Queen's Univ. (Geological Sciences):
A paleomagnetic investigation of the structural integrity of the southern Peruvian Andes, 1982-; Ph.D. thesis (Langridge).

Samples are being collected for detailed paleomagnetic analysis from Phanerozoic rock units of southeastern Peru with the aim of determining the paleolatitude of formation of the rocks and their rotational history. This information will enable us to establish the overall structural and accretionary history of the Arequipa Massif.

320. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, R. Dumont et Ass.:
Production de cartes couleurs synthèse de données géophysiques en Abitibi, Québec, 1984.

A partir des données existantes, produire une carte synthèse (1:250 000) du magnétisme en Abitibi à l'aide du procédé Applicon.

321. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, ACSI Ltée.:
Production d'une carte Applicon du magnétisme dans la région de Brouillan-Manthet en Abitibi, Québec, 1984.

Produire une portion d'un levé INPUT sur une carte APPLICON.

322. LERBEKMO, J.F., Univ. Alberta (Geology):
Magnetostratigraphy of the late Cretaceous and Paleocene of Alberta, and parts of Saskatchewan, Montana and North Dakota, 1973-75.

Additional magnetostratigraphy to be done in Cypress Hills of southeastern Saskatchewan and southwestern Alberta and in the Coal Valley area of the Foothills in summer of 1984.

323. McGLYNN, J.C., Geol. Surv. Can.:
Paleomagnetic study of Proterozoic red beds of the western Canadian Shield, 1968-.

324. MURTHY, G., GOWER, S., Memorial Univ. (Earth Sciences):
Paleomagnetism of Carboniferous of western Newfoundland, 1983-85.

Paleomagnetism of the Carboniferous Codroy Group of western Newfoundland is studied. Oriented samples were collected, during the summer of 1983, from the Spout Falls, Robinson's River, and Searston Formations of this sedimentary basin. Systematic thermal demagnetization was conducted of each specimen up to 700°C. The following components of magnetization are isolated for the various formations: Spout Falls Formation: 1) B component, with respect to bedding: D = 342.1, I = -19.3, α_{95} = 8.4, k = 14.1, paleopole at 29.4°N, 141.5°E and a corresponding paleolatitude of 10°S; 2) C component with respect to present horizontal: D = 136.9, I = -36.9, α_{95} = 20.2, k = 8.5, paleopole at 45.3°N, 186.6°E and a corresponding paleolatitude of 20°S; 3) a magnetization, probably Kiaman of D = 177.1, I = -4.6, α_{95} = 10.1, k = 19.3, paleopole at 48.4°N, 145.5°E and a corresponding paleolatitude of 9.1°S; Robinson's River Formation: 1) B component, with respect to bedding: D = 348.1, I = -39.4, α_{95} = 16.5, k = 12.2, paleopole at 18.7°N, 132.8°E and a corresponding paleolatitude of 22°S; 2) C component (w.r.t. present horizontal) D = 291.8, I = 22.9, α_{95} = 18.3, k = 26.2, palepole at 23.3°N, 203°E and a corresponding paleolatitude of 12°N; Searston Formation: 1) B component: D = 163.0, I = 15.4, α_{95} = 5.3, k = 43.9, paleopole at 32°S, 38.8°W corresponding paleolatitude of 7.8°N; 2) C component D = 127.4, I = -10.3, α_{95} = 10.9, k = 11.6, paleopole at 28°S, 4.8°E, paleolatitude = 5°S. The significance of these magnetizations is presently being studied.

325. OLSON, D.G., Geol. Surv. Can.:
High resolution aeromagnetics (experimental surveys), 1968-.

326. READY, E.E., Geol. Surv. Can.:
Aeromagnetic survey: Gulf of Maine-Georges Bank and adjoining continental margin, 1982-.

327. SAWATZKY, P., Geol. Surv. Can.:
High resolution aeromagnetics (instrumentation development), 1977-.

328. SCHWARZ, E.J., École Polytechnique (Génie minéral):
History of vertical movements of the Precambrian Shield, 1982-86; M.Sc.A.

See:

Uplift deduced from remanent magnetization: Sudbury area since 1250 Ma ago; Earth and Planetary Sci. Letters, vol. 58, p. 65-74, 1983.

Onse sones de contact de différents dykes près de Yellowknife ont été echantillonés. Les resultats seront prêts pour publication 1984/85. Plusieurs contacts ont été echantilloné dans le province du Supérieur entre Chibougamau et Sault St. Marie et egalement étudiés. Les resultats ne sont pas suffisamment bons et une re-echantillonage est planifié pour l'été 1984.

GEOTHERMAL/GÉOTHERMIQUE

329. WRIGHT, J.A., FANG, C.-L., Memorial Univ. (Earth Sciences):
Marine geothermal measurements along the Atlantic margin of Canada, 1980-; Ph.D. thesis (Fang).

The marine heat flow program is continued with primary emphasis on the south coast of Newfoundland and Bay St. George in the Gulf of St. Lawrence. The survey area on the south coast traverses the Gander/Avalon boundary and presents an opportunity to ascertain whether there exists any geothermal signature to the ancient margin between the continental Avalonian basement (presumed more acidic) and the oceanic Gander basement (presumed more basic). The heat flow in the Bay St. George basin is part of an integrated geological/geophysical study of the fossil fuel potential of the basin. The gravity and seismic surveys as part of this project are NSERC Strategic (Energy) funded. One of the goals of the research is to evaluate the petroleum potential through model studies of the subsidence and thermal history of the basin. The proposed geothermal measurements provide important constraints to the modelling process. The geothermal measurements also allow an evaluation of the low grade geothermal energy potential of the basin.

GRAVITY/GRAVITÉ

330. CHURCH, B.N., BRASNETT, D., EASTWOOD, P., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Gravity surveys of Tertiary basins in southern British Columbia.

See:

Geology and gravity survey of the Tulameen coal basin; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1983-1, p. 47 to 54, 1983.

Two gravity lines across the Tulameen basin give a profile of the Tertiary formations which includes the basal volcanic and sedimentary rocks and coal measures. The 800 metres of strata comprising the basin record a history of early volcanic eruption causing disruption of drainage patterns, stagnation leading to sedimentation and coal formation, and finally infilling by coarse sandstones and conglomerates. Preservation of these rocks resulted from normal faulting, folding, and extrusion of young basalt lavas. The gravity results suggest that the central depth of the basin is much shallower than first indicated by the average 35 to 40° dips obtained on beds exposed in peripheral areas. Resurging volcanic activity is thought to be responsible for a central upwelling causing the unexpected shallow dish-shaped cross-section of the basin.

The Leech River fault has been traced by gravity methods on an east by southeast course passing under Colwood delta between Langford Lake and Esquimalt Lagoon. A southwesterly dip of the fault plane is demonstrated showing dense Metchosin oceanic basalt (Tertiary age) on the hangingwall and older less dense Leech River migmatite crystalline complex on the footwall. The attitude of this important fault is reverse to Clapp's (1917) original interpretation and that of Tipper et al. (1981), thereby shedding new light on plate boundary models for the area.

331. GODFREY, J.D., SPRENKE, K.F., LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):
Geophysical aspects of the Shield in Alberta, 1972-84.

Interpretation and correlation of gravity, aeromagnetic and radiometric surveys with bedrock lithology and structure complete. Crustal model and deep structural configuration established.

332. GUPTA, V.K., Ontario Geol. Surv.:
The Sudbury gravity anomaly 1980-84.

See:

On the Sudbury gravity anomaly; Ontario Geol. Surv., Misc. Paper 116, p. 145-147, 1983.

333. MILLER, H.G., Memorial Univ. (Earth Sciences):
Onshore-offshore geophysical studies of Avalon Zone, Newfoundland, 1980-86.

See:

Geophysical constraints on the size and extent of the Wabana hematite deposit; Econ. Geol., vol. 78, p. 1017-1021, 1983.

A geophysical interpretation of the geology of Conception Bay, Newfoundland; Can. J. Earth Sci., vol. 20, p. 1421-1433, 1983.

The basic mapping and associated interpretation on the project is continuing to the area south of Newfoundland. By 1986 the nearshore areas around the Avalon Zone will have been mapped as will the appropriate peninsulas of the Avalon.

SEISMOLOGY AND PHYSICS OF INTERIOR/ SISMOLOGIE ET PHYSIQUE DE L'INTÉRIEUR DE LA TERRE

334. BROWN, R.J., Univ. Calgary (Geology and Geophysics):
Equidistant latitudes in source-receiver distance and travel-time corrections, 1981-84.

See:

On the determination of source-receiver distances using a new equidistant latitude; Geophys. J. Roy. Astr. Soc., vol. 76, p. 445-459, 1984.

A New 'equidistant' latitude has been presented which reduces ellipticity errors in source-receiver distances by a factor of about 1000. This has an obvious application in the determination of surface-wave velocities by the two-station method. But body-wave travel time becomes less and less coupled to surface source-receiver path length as distance increases. Current studies indicate that the use of equidistant latitudes obviates the ellipticity travel-time correction for distances up to about 30°.

335. CHEADLE, S.P., LAWTON, D.C., Univ. Calgary (Geology and Geophysics):
Physical seismic model studies of permafrost related structures, 1982-86; Ph.D. thesis (Cheadle).

A large (4m x 3m x 2m) waterfilled tank has been constructed for use as a physical seismic modeling facility. Scale geological models exhibiting an acoustic velocity structure of interest are submerged in the tank. Ultrasonic source and receiver piezo-electric transducers are moved about the tank over the model by stepper motors under computer control, to simulate a variety of seismic experiments. The source signal generation and the digital data recording systems are also under computer control.

The first application of the system will be a study of the seismic imaging problems created by permafrost-related velocity structures such as those experienced in the Beuafort Sea shelf area. Concepts of source and receiver array design, data processing and imaging techniques will be explored in an effort to improve the high resolution shallow reflection seismic method in areas affected by permafrost.

336. FRYDECKY, I.I., Geol. Surv. Can.:
Marine reflection seismology of the Western Canadian Continental Margin, 1983-.

337. GAGNE, R.M., Geol. Surv. Can.:
Shallow seismic, 1979-.

338. HAMILTON, T.S., Geol. Surv. Can.:
The geology of the Strait of Georgia, British Columbia, 1982-.

339. HAWORTH, R.T., Geol. Surv. Can.:
A geophysical investigation of the submarine extension of geological zonation of Newfoundland, 1979-.

340. HUNTER, J.A., Geol. Surv. Can.:
Permafrost seismic, 1973-.

341. KEEN, C.E., Geol. Surv. Can.:
Seismic studies of continental margins and ocean basins of the North Atlantic, 1980-.

342. KREBES, E.S., Univ. Calgary (Geology and Geophysics):
Seismic wave propagation in a linear viscoelastic medium, 1977-.

See:

Discrepancies in energy calculations for inhomogeneous waves; Geophys. J. Royal Astr. Soc., vol. 75, p. 839-846, 1983.

The viscoelastic reflection/transmission problem: two special cases; Bull. Seism. Soc. Am., vol. 73, p. 1673-1683, 1983.

343. MOON, W., CARSWELL, A., OWUSU, J., Univ. Manitoba (Earth Sciences):
The VSP (Vertical Seismic Profiling) experiment at the AECL URL site, Pinawa, Manitoba, 1983-86; M.Sc. theses (Carswell, Owusu).

344. MOON, W., DILLISTONE, C., Univ. Manitoba (Earth Sciences):
CRUST and upper mantle structural study of Prairie region of Canada using Seismic Surface wave, 1983-85; M.Sc. thesis (Dillistone).

345. NYLAND, E., DUSSEAULT, M.B., Univ. Alberta (Physics, Civil Engineering):
Microseismic mapping of in situ processes for energy recovery, 1982-85.

See:

Fireflood microseismic monitoring: results and potential for process control; J. Can. Petrol. Technol., vol. 22, no. 2, p. 62-68, 1983.

Passive seismic monitoring of in situ processes for energy recovery; Proc. Field Measurements in Geomechanics, Zurich, Switzerland, 1983.

To finalize the construction and field application of a $500 000 truck and equipment to monitor firefloods and steam floods to determine processes and control them.

346. OVERTON, A., Geol. Surv. Can.:
Borehole geophysics (Seismic techniques), 1982-.

347. POLEY, D.F., LAWTON, D.C., Univ. Calgary (Geology and Geophysics):
A high resolution reflection seismic study over permafrost affected sediments of the Beaufort Sea, 1982-84; M.Sc. thesis (Poley).

Six high resolution seismic lines have been selected from two areas of the southern Canadian Beaufort Sea. These have been processed for comparison of data acquisition systems. Further processing will be done including inversion, and testing of an iterative stacking algorithm for velocity analysis of high resolution data. As well, the seismic lines, their inversions, and logs from two drill holes will be interpreted for development of feasible models of shallow permafrost distribution. These will then be tested by a 3-D forward numerical modelling technique.

348. REID, I., Geol. Surv. Can.:
Seismicity studies of the eastern Canadian margin, 1983-.

349. SANTOS, R.R., BROWN, R.J., Univ. Calgary (Geology and Geophysics):
Theory of wave propagation in porous rocks, in particular, hydrocarbon reservoirs, 1981-85; Ph.D. thesis (Santos).

To develop a theory of wave propagation in a porous medium filled with a two-phase formation fluid moving in dispersed laminar flow. Formation brine forms the continuous phase and gas bubbles the dispersed phase. The rock matrix and fluids are modelled as a two-phase mixture to formulate the seismic wave propagation starting from the balance equations. Account is taken of fluid type, gas saturation, confining pressure, pore pressure, temperature, wettability and porosity.

350. VARSEK, J.L., LAWTON, D.C., Univ. Calgary (Geology and Geophysics):
Testing a shotgun seismic source for shallow hydrocarbon exploration, 1982-84; M.Sc. thesis (Varsek).

To test a single shotgun surface source as an inexpensive, reliable, effective method for obtaining reflection seismic data for depths up to 800 m subsurface. The study tested the effects of multiple shots per station and subsurface coverage (fold) on data quality. In addition, noise attenuation experiments were accomplished by source skids, receiver arrays and recording filters. Data processing, particularly deconvolution and stacking greatly enhanced reflection data. The integration of seismic acquisition methods and data processing are analysed in terms of survey planning and seismic interpretation.

During the study, useful reflection data were obtained between .3 and .7 seconds (300 to 800 m subsurface). In good data areas, reflections at .9 seconds and refracted arrivals to offsets as far as 600 m are clearly visible on field records. However, surface and wind conditions profoundly affect data quality. Reflection frequencies are similar for both dynamite and seisgun data, begin in the range of 20 to 70 hz. In good seismic areas seisgun and dynamite sections are comparable in data quality to a depth of 600 m subsurface.

OTHER/AUTRE

351. BAZINET, R., École Polytechnique (Génie minéral):
Etude des procédés de localisation des canalisations de drainage agricole, 1983.

Le projet visait à déterminer quels outils géophysiques seraient les plus susceptibles de permettre la localisation de canalisations de plastique enfouies sous le sol. Il est ressorti que seul la séismique haute résolution peut résoudre ce problème.

352. KATSUBE, T.J., Geol. Surv. Can.:
Pore structure in crystalline rocks, 1981-.

353. KEEN, C.E., Geol. Surv. Can.:
Rift processes and the development of passive continental margins, 1980-.

354. KILLEEN, P.G., Geol. Surv. Can.:
Borehole geophysics (nuclear techniques), 1974-.

355. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Sagax Inc.:
Relevé Pôle-Pôle Latéral (PPL) dans la région du Lac Wanconichi, Québec, 1984.

Evaluer le potentiel de cette nouvelle méthode de géophysique sur un site où des tests avec d'autres méthodes ont été effectués.

356. LEFEBVRE, D.L., Québec Ministère Énergie et Ressources, Les Relevés Géophysiques Inc.:
Levé gradiométrique en Abitibi, Québec, 1984-85.

Levé gradiométrique pour parfaire les connaissances géologiques et activer l'exploration minière dans la région de Matagami.

357. MOON, W., TANG, R., Univ. Manitoba (Earth Sciences):
Geodynamic application of satellite altimeter data, 1982-85; M.Sc. thesis (Tang).

358. MWENIFUMBO, C.J., Geol. Surv. Can.:
Borehole geophysics applications to coal, 1982-.

359. RANALLI, G., FADAIE, K., ERNST, R., MORAVEC, A., CHERNIS, P., Carleton Univ. (Geology):
Role of rheology in geodynamics, 1981-; Ph.D. theses (Fadaie, Ernst), M.Sc. theses (Moravec, Chernis).

See:

Rheology of rocks under crustal conditions; Geol. Soc. Amer., Abstracts with Programs, vol. 15, p. 646, 1983.

The rheology of the lithosphere and mantle is studied theoretically on the basis of the microphysics of creep in polycrystals at high pressure and temperature. Viscosity profiles for the mantle have been obtained. The role of dynamic recrystallization in the deformation of tectonites and its relevance to paleostress determination has been examined. The work is now proceeding to determine the relevance of superplasticity, Harper-Dorn creep and recrystallization to the rheology of shear zones in the lithosphere and mantle flow.

360. ROCHESTER, M.G., MERRIAM, J.B., Memorial Univ. (Earth Sciences):
Theoretical global geodynamics and planetary physics, 1961-.

See:

Inertial and ellipsoidal Earth effects on gravity tide observations; Proc., Ninth Internat. Symp. on Earth Tides, p. 137-144, 1983.

Variations in the Earth's rotation; Science Progress, vol. 68, p. 387-401, 1983.

361. SCHWARZ, E.J., Geol. Surv. Can.:
Geophysical interpretation Abitibi Belt, Ontario and Quebec, 1983-.

See:

Preliminary gravity, magnetic and refraction seismic results from the Abitibi Belt, Quebec; Geol. Surv. Can., Paper 84-1A, p. 239-246, 1984.

ENGINEERING GEOLOGY/GÉOLOGIE DE L'INGÉNIEUR

362. ABET, M.Y., BERARD, J., École Polytechnique (Génie minéral):
Etude des causes de la déformation du barrage de Beauharnois, Québec, 1983-84; M.Sc.A. (Abet).

Le barrage de Beauharnois subit des déformations mécaniques que nous croyons reliées aux réactivités alcalis-silice qui se produiraient entre les grès (orthoquartzites) et les alcalis du ciment Portland. Le but de notre étude est d'établir le mécanisme de réaction.

363. ASH, P.O., DUSSEAULT, M.B., Univ. Waterloo (Earth Sciences):
Swell-slake behaviour of smectitic clay-shales in fluids of different solids contents, 1984-85; M.Sc. thesis (Ash):

To determine slurry transport and disposal potential of an overburden/sludge mixture for Syncrude Canada Ltd., and to assess closed-system moisture transfer between a sludge and a swelling smectitic clay-shale overburden of high suction potential.

364. CHURCHER, P., DUSSEAULT, M.B., Univ. Waterloo (Earth Sciences):
Clay minerals and tertiary recovery in Ontario oil reservoirs, 1984-86; M.Sc. thesis (Churcher).

To characterize clay minerals in Ontario oil reservoirs, and to determine their tendency to absorb surfactants in tertiary oil recovery processes.

365. DUSSEAULT, M.B., MRAZ, D., UNRAU, J., FORDHAM, C., Univ. Waterloo (Earth Sciences):
Salt rock geomechanics, 1982-85; Ph.D. thesis (Fordham).

See:

Salt rock constitutive behavior; Proc. Potash '83, Saskatchewan, p. 311-320, 1983.

Method of correlation of laboratory tests with in situ conditions; Proc. VI Internat. Symp. on Salt, Toronto, Ontario, 1983.

To explore the constitutive behaviour of salt rocks; to evolve and test hypotheses in the field; to continue to develop superior design methods for mine pillars and rooms; to increase extraction ratios in potash mines; and to rationally design solution storage caverns in salt deposits.

GEOTECHNIQUE/GÉOTECHNIQUE

366. DUSSEAULT, M.B., SCOTT, J.D., SODERBERG, H., MORAN, S., ZINTER, G., Univ. Alberta (Civil Engineering):
Post-reclamation mine subsidence in smectitic clay-shale coal overburden, Alberta, 1980-84.

See:

Post-reclamation subsidence of strip mine cast back overburden; Proc. 36th Canadian Geotech. Conf., Vancouver, B.C., 1983.

Rapid index tests for transitional material; ASTM Geotech. Testing J., vol. 6, no. 2, p. 64-72, 1983.

To determine mechanisms responsible for post-reclamation mine subsidence for Alberta coal strip mines; to quantify the amount and extent of subsidence and its engineering consequences; and to investigate the role of smectitic clay-shales in the subsidence.

367. EGGINTON, P.A., Geol. Surv. Can.:
Hydraulic, morphologic and morphometric studies of selected rivers along the Mackenzie Highway, 1975-.

See:

Particle-size distributions of the surface of alluvial channel beds; Geol. Surv. Can., Paper 83-1B, p. 299-302, 1983.

368. EVANS, S.G., Geol. Surv. Can.:
Landslide hazard in the Canadian Cordillera, 1983-.

See:

The Enderby Cliffs landslide, British Columbia; Geol. Surv. Can., Paper 83-1B, p. 423-427, 1983.

The 1880 landslide dam on Thompson River, near Ashcroft, British Columbia; Geol. Surv. Can., Paper 84-1A, p. 655-658, 1984.

369. GADD, N.R., Geol. Surv. Can.:
Geological variability of marine deposits, Ottawa-St. Lawrence Lowland, 1974-.

370. HEGINBOTTOM, J.A., Geol. Surv. Can.:
Slope processes and cryogenic movements, Arctic Islands, 1977-.

371. KIM, C.S., GRICE, R.H., HESSE, F.R., BROWN, R., McGill Univ. (Geological Sciences):
The influence of composition and micro-lithology on the weathering susceptibility of Ordovician mudrock in the Montreal, Quebec area, 1980-84, Ph.D. thesis (Kim).

A small suite of mudrock from a working quarry in Ordovician mudrock in the Montreal, Quebec area has been shown to include four facies – clay-rich (A), silt-rich (C), transitional (B) mudrock, and siltstone (D). XRD, XRF, SEM, microprobe and BET analyses established that the mudrock facies had similar minerology with few relative variations in the clay mineral assemblages of illite, chlorite and less than 10% of expandible mixed layer species. The carbonate appeared to be present as silt grains rather than as cement. Organic maturation studies suggested that the mudrocks were near the end of the middle stage of diagenesis. The highest degree of susceptibility to moisture was found in a clay-rich facies in which there was a strong parallelism of the clay minerals and a relatively loose packing with mesopores of radii between 2 and 10 mm which were not identified in the other facies.

372. KONAN, G., BERARD, J., École Polytechnique (Génie minéral):
Etude des infiltrations d'eau dans le Métro de Montréal, Québec, 1983-84; M.Sc.A. (Konan).

Ce projet a pour but de déterminer le lien qui existe entre la topographie, la géologie, l'occupation des terres (ancienne et actuelle) et le taux d'infiltration et la nature physico-chimique et bactériologique des eaux d'infiltration dans le Métro de Montréal.

373. MORGENSTERN, N.R., CHAN, A., Univ. Alberta (Civil Engineering):
Geotechnical characteristics of a superglacial lacustrine clay deposit, Genesee, Alberta, 1983-85; Ph.D. thesis (Chan).

The study area is the site of the Genesee Power Generation Station, situated at Genesee which is about 60 km southwest of Edmonton, Alberta. Available information indicates that the surficial lacustrine clay at Genesee was deposited on stagnant ice during the last ice retreat from Alberta. Recent field investigations confirm the original hypothesis that the main effect of post depositional ice melting was to induce differential lateral stresses within the clay deposit. The undrained shear strength, as determined by in situ vane shear tests, agreed with the theoretical predictions of undrained strength from the coefficients of earth pressure determined from the lateral stress measurements. Therefore, if a pattern of lateral stress distribution can be set up, then it is possible to predict variation of strengths within a superglacial deposit. Consequently, future work will consist of modelling the processes undergone by a superglacial deposit with a view to predict the pattern of lateral stress distribution.

374. RUSSELL, D.J., Ontario Geolo. Surv.:
Fracture analysis of Ordovician mudstones and shales, 1982-.

375. RUSSELL, D.J., Ontario Geol. Surv.:
Fracture analysis of Ordovician mudstones and shales, 1982-.

376. SCOTT, J.D., DUSSEAULT, M.B., SODERBERG, H., Univ. Alberta (Civil Engineering):
Behavior of syncrude sludge, 1982-85.

To determine the behavior of Syncrude Sludge from oil sand processing; to explore option in waste management; and to analyse time/consolidation/sedimentation effects in waste management systems for sludge/sand mixtures.

377. SEGO, D.C., Univ. Alberta (Civil Engineering):
Strength and deformation of frozen saline sand, 1980-85.

See:

Confining pressure influence on the behaviour of frozen saline sand; Proc. Third Internat. Cold Regions Engineering Specialty Conf., Edmonton, 1984.

The influence of both strainrate and confining pressure on the strength and deformation of frozen sand with saline pore fluid is being evaluated. The salinity of the pore fluid is being varied over a wide range to establish how it also affects the frozen sand behaviour.

378. SEGO, D.C., MORGENSTERN, N.R., Univ. Alberta (Civil Engineering):
FOUNDATION – Control of frost penetration under farm building foundations with and without perimeter insulation, 1984-85.

To prepare a draft of a design manual for foundations of unheated farm building to prevent frost heave damage in Canada.

379. SEGO, D.C., MORGENSTERN, N.R., WHITTEBOLLE, R.J., Univ. Alberta (Civil Engineering):
Geotechnical behaviour of sand containing gas hydrate – Phase 2, 1983.

See:

Engineering behaviour of a sand containing gas hydrates; Proc. Third Internat. Cold Regions Engineering Specialty Conf., Edmonton, 1984.

Following the development of a laboratory facility in Phase 1, Phase 2 consisted of establishing a procedure to make reproducible samples and measure the strength and deformation behaviour of the samples. Sonic velocities in the hydrate samples are also measured, as is the behaviour of the sample during hydrate decomposition.

380. STUART, N.J., EMR (CANMET), Calgary Coal Res. Lab.:
An evaluation of the effect of structure features on rock mechanics in the Sparwood area of British Columbia, 1984-.

To evaluate the effect of mesoscopic fabrics on strata behaviour around mining operations at Sparwood. In particular to consider computerized treatment of joint distributions and to consider genetic aspects of the structure. To assess the likely practical benefits of a more extensive structural survey.

GEOTHERMAL/GÉOTHERMIQUE

381. PALMER, J.H.L., SVEC, O.J., National Research Council of Canada (DBR):
Ground heat storage, 1978-.

See:

A heat exchanger for in-ground heat storage; Proc. Internat. Conf. on Subsurface Heat Storage in Theory and Practice, Stockholm, June 6-8, 1983.

The research project consists of the testing of four full-scale in-ground storage systems, model testing of a laboratory prototype and developing of a numerical model. The full-scale storage units are designed to cover the range from an insulated buried conventional water tank to a novel in-ground heat storage scheme. In this new approach a nest of deep lined holes provides heat exchange between the working fluid (water) and the storage medium (undisturbed natural ground). These full-scale systems are controlled and monitored by a PDP 1134 B computer with most of the software already developed. A laboratory and a field prototype of a single heat exchanger for the novel storage scheme have been successfully constructed and tested. The field system is operational and various tests are in progress.

Additional studies have been undertaken in conjunction with the International Energy Agency on the subject of vertical earth heat exchangers for use with heat pumps.

PERMAFROST/PERGÉLISOL

382. BAKER, T.H.W., National Research Council of Canada (DBR):
Physical and mechanical properties of frozen ground, 1971-85.

See:

Application of time-domain reflectometry to determine the thickness of the frozen zone in soils; Proc. 3rd Internat. Symp. on Ground Freezing, Hanover, N.H., vol. 2, 1983.

Compliant platens have been manufactured and sent to several consulting firms for field and laboratory testing. Time-domain reflectometry has been used to provide quality control on preparing artificially frozen sand specimens. A non-contacting transducer was purchased to be used in the volume change apparatus. This modification has not been completed. Varved samples of permafrost from Thompson, Manitoba (collected March 1978) have been tested in unconfined compression at various orientations to the varves. Results were compared to specimens without varves. All of this clayey silt material had a remarkably uniform total water content.

Time-domain reflectometry (TDR) was used to monitor movement of the freezing front at a sandy loam field site in conjunction with a field program operated by Agriculture Canada. Results were correlated with ground temperature measurements. Laboratory freezing tests were continued using Rideau clay as a typical fine-grained soil. Thermocouples were used to measure temperature profiles. Preliminary results using X-ray techniques showed excellent correlation with the TDR measurements.

383. GOODRICH, L.E., JOHNSTON, G.H., PENNER, E.. National Research Council of Canada (DBR):
Ground thermal regime, 1970-.

See:

Thermal performance of a section of the Mackenzie Highway; Fourth Internat. Conf. on Permafrost, Proc. 1983.

Field work has been completed for a study of thermal effects of road embankments on permafrost, Mackenzie Highway, Mile 419.5. Field measurements of soil thermal conductivity have been completed at Ottawa, Thompson Manitoba, and Mile 419.5, Mackenzie Highway, and a report will be prepared. A paper dealing with the influence of snow covers on the ground thermal regime has been published. Work is under way on a numerical model which will eventually be extended to model frost heaving.

384. HEGINBOTTOM, J.A., Geol. Surv. Can.:
Properties and distribution of permafrost and ground ice, 1983-.

385. JOHNSTON, G.H., National Research Council of Canada (DBR):
Field observations of performance of foundations of buildings, bridges, roads, airfields, utilities, etc., 1950-.

Observations on performance of bridge and building foundations and data collection for evaluating parameters for design and construction of embankments, buried utilities and foundations of structures constructed in permafrost areas were continued.

386. JOHNSTON, G.H., GOODRICH, L.E., National Research Council of Canada (DBR):
Insulated embankments on permafrost, 1972-83.

See:

Performance of an insulated roadway on permafrost, Inuvik, N.W.T.; Fourth Internat. Conf. on Permafrost, Proc. 1983.

Observations continuing at infrequent intervals on performance of insulated and uninsulated test sections installed on the Mackenzie Highway south of Inuvik, N.W.T., and on Dempster Highway in northern Y.T., to evaluate the thermal behaviour and determine the parameters required for design. Observations at test sections on Mackenzie Highway south of Wrigley, N.W.T., terminated in February 1981; reported in preparation.

387. KURFURST, P.J., Geol. Surv. Can.:
Measurements of dynamic elastic moduli of frozen and unfrozen surficial materials, 1982-.

388. MICHEL, F.A., Carleton Univ. (Geology):
Isotope investigations of northern groundwater, permafrost and related phenomena, 1983-.

See:

Isotope variations in permafrost waters along the Dempster Highway pipeline corridor; Fourth Internat. Conf. on Permafrost, Proc., p. 843-848, 1983.

During the summer of 1983 a field program was initiated to examine massive ground ice at several sites within central and northern Yukon. Continuous core was recovered from a 12.5 metre hole near Mayo and several shallower holes were also completed at the site. Core material was also collected from sites along the Dempster Highway, including one near the Ogilivie River crossing and one near the Eagle River crossing. The stratigraphy and ice-soil relationships were found to be much more complex than originally suspected. Samples were shipped to Ottawa for further work. Water has been extracted from all samples and these waters are currently being analysed for isotopic composition.

389. PARAMESWARAN, V.R., National Research Council of Canada (DBR):
Physical and mechanical properties of frozen soils; model studies of foundations in frozen ground, 1975-.

See:

Field measurements of electrical freezing potentials in permafrost areas; Fourth Internat. Conf. on Permafrost, Proc. 1983.

Deformation behaviour of forzen sand-ice materials under triaxial conditions, ibid., 1983.

Adfreeze strength of various kinds of piles in frozen soils was determined at various temperatures under static and dynamic loading conditions. A superimposed alternating load enhances the rate of displacement of piles in frozen soils. Compressive strength of various kinds of frozen soils at various temperatures and moisture content is being measured under confined and unconfined conditions. To combine the results from these measurements and develop a criterion for design of foundations in frozen ground.

390. TAYLOR, R.B., Geol. Surv. Can.:
Permafrost processes in Arctic beaches, 1983-.

ROCK MECHANICS/MÉCANIQUE DES ROCHES

391. ANNOR, A., MIRKOVICH, V., EMR (CANMET):
Underground nuclear waste repository, 1977-88.

Simple thermal/mechanical characterisation of three of four research areas is now complete as well as triaxial studies on representative lithologies from each.

A model to predict rock joint hydrothermo-mechanical properties from limited joint property measurements has been developed under contract. Joint core data has been developed for its assessment at URL. In the same vein, large blocks have been assembled for joint block tests.

Preliminary studies were carried out to redesign the Creighton Mine heater test for execution at URL (AECL Underground Research Laboratory located on Lac Du Bonnet Batholith).

Triaxial studies were completed on select formations at the URL facility. Specifically, lithologies in which underground test galleries will be driven.

392. ARNOLD, R.G., REEVES, M.J., Univ. Saskatchewan (Geological Sciences), Saskatchewan Research Council:
Evaluation of triaxial creep cells for testing large diameter evaporite cores, 1983-84.

Ten large hydraulic cells built in the late 1970's and housed in the Saskatchewan Research Council Laboratories are under investigation to determine their limitations in both creep and relaxation testing of potash and other relatively soft rocks. The cells have a maximum axial load capacity of 40 MPa with a similar maximum confining pressure. Samples with diameters up to 200 mm may be tested triaxially. Computer data acquisition and control systems are under test. The accuracy and precision of the hydraulic loading systems have been determined for both elastic and viscoelastic test specimens.

393. ASTON, T.R.C., EMR (CANMET), Cape Breton Coal Res. Lab.:
Development and initiation of instrumentation programmes to monitor seafloor subsidence in order to determine the applicability of existing undersea mining guidelines, 1983-.

See:

Discussion paper: Subsidence research in the Sydney coalfield; CANMET Div. Rept. ERP/CRL 83-10(R), 1983.

A long term subsidence research programme is currently being initiated to investigate the applicability of existing undersea mining guidelines. At present a DSS research contract is in progress to assess potential instrumentation suitable for monitoring seafloor subsidence and this is expected to be completed by March 1985. A detailed assessment of current subsidence prediction techniques and their application to the Sydney coalfield is also in progress.

394. ASTON, T.R.C., CAIN, P., EMR (CANMET), Cape Breton Coal Res. Lab.:
Investigate the outburst/rockburst phenomena experiences at No. 26 Colliery, Sydney coalfield, Nova Scotia, 1984-89.

See:

Outbursts at No. 26 Colliery; CANMET Div. Rept. ERP/CRP 84-1(R), 1984.

Since 1981, No. 26 Colliery has experienced a series of rock/outbursts, primarily in the main development deeps, which have increased in severity with depth. A review of current rock/outburst research is therefore being undertaken along with geotechnical monitoring and an investigation into the application of potential preventative techniques.

395. CAIN, P., EMR (CANMET); Cape Breton Coal Res. Lab.:
Investigation into the mechanism of gobside leakage associated with different roadway drivage and gateside packing techniques and the effectiveness of preventative measures, 1983-86.

See:

The study of air leakage across longwall wastes; CANMET Div. Rept. ERP/CRL 83-26(R), 1983.

Ventilation losses due to the leakage of air through gateside packs and across the caved section of the longwall panel (gob or waste) is a major concern in the Sydney Coalfield. Geotechnical field investigations are presently being initiated to determine the mechanism of gobside leakage associated with different roadway drivage and gateside packing techniques and asses the effectiveness of preventative measures.

396. CAIN, P., ASTON, T.R.C., EMR (CANMET), Cape Breton Coal Res. Lab.:
A detailed evaluation of barrier pillar design criteria and their application to the Sydney Coalfield, 1983-88.

See:

A proposal for barrier pillar research in the Sydney coalfield; CANMET Div. Rept. ERP/CRL 83-17(R), 1983.

Detailed back analysis of barrier pillar performances in the Sydney coalfield, Nova Scotia; CANMET Div. Rept. ERP/CRL 84-11(J,OP), 1984.

During 1983, a field data collection programme was undertaken in some 35 km of accessible gateroad at the Lingan and No. 26 Collieries, Sydney coalfield, in order to provide a data base from which a detailed evaluation of current barrier pillar design criteria could be made. It is then intended to undertake geotechnical field investigations to refine the evaluation criteria best suited and initiate its application to the Sydney coalfield.

397. CRUDEN, D.M., FOSSEY, K., MASOUMZADEH, S., Univ. Alberta (Geology):
Stability of natural slopes in rock, 1971-; M.Sc. theses (Fossey, Masoumzadeh).

See:

Creep in brittle rock after an increment of uniaxial load; Can. Geotech. J., vol. 20, p. 836-839, 1983.

Detailed mapping of selected sites at which large downslope movements in rock are occurring, or have occurred, has continued. Laboratory work is providing a theoretical basis for these studies.

398. DAS, B., EMR (CANMET):
Rock properties/classification for coal mining applications; 1982-87.

A rock classification system for application in underground coal mining has been developed through contract work. It is planned to verify this system for different coal fields in Canada. The study includes both laboratory and field tests, evaluation of the results for any necessary modifications that may be suitable for Canadian conditions and to determine the most effective tests for this purpose. It is proposed to develop a rock properties data bank for the geotechnically distinct coal fields for use in mine planning, in mine development and for the most effective exploitation of the Canadian coal resources.

399. EISBACHER, G.H., Geol. Surv. Can.:
Study of large landslides in the Cordillera, 1976-.

400. FISEKCI, M.Y., EMR (CANMET):
Further improvements and extended applications of the subsidence monitoring and telemetry system, 1982-84.

New project on "Subsidence Prediction and Control" along the following steps which are considered vital for safe and efficient mining in the deeper level of the hydraulic mine and planned mining in the new area:

1) computer approach into analysis of local tectonics (faults, folding, their orientation, throw, etc.) and lithology (rock type above and below coal seams, thickness, gradient and their changes within planned area);

2) interpretation of above data for effective subsidence prediction and control, selection of mining method, size of pillar, opening and layout, etc.

401. GYENGE, M., BÉTOURNAY, M., EMR (CANMET):
Rock properties and support systems, 1980-.

See:

Design aspects of bolting systems; CANMET MRL Rept. MRP/MRL 83-75 (OP,J), 1983.

Post failure test procedures have been developed for the study of ductile rock using previously developed stiff test apparatus. Progress has been made towards preparing bolting guidelines for hard rock mines. The guidelines should be available in mid-84.

402. HEDLEY, D.G.F., MacDONALD, P., ARJANG, B., EMR (CANMET):
Mine and regional stability, 1980-

See:

Performance of bolting systems subject to rockburst; CANMET MRL Rept. MRP/MRL 83-75 (OP,J), 1983.

Microseismic monitoring in a uranium mine; CANMET MRP/MRL Rept. 83-74 (OP,J), 1983.

The microseismic system at Quirke Mine has been expanded into the adjacent Denison mine to provide a larger area of coverage. The study to evaluate the effect of pillar orientation and the position of access drifts on mine stability has been completed as has the investigation evaluating the performance of rockbolt systems during rockbursts. A review has also been completed of the use of microseismic systems in Canadian mines.

403. HEDLEY, D.G.F., SWAN, G., ARJANG, B., EMR (CANMET):
Rock properties and support systems, 1983-88.

Based on investigations of underground mine opening stability when geological structure and gravitational forces are the major causes of failure, to devlop empirical, statistical and/or deterministic models to predict stable mine structures.

404. LOFTSSON, M., DUSSEAULT, M.B., SENIOR, S., Univ. Waterloo (Earth Sciences):
The mechanical properties of the Kettle Point oil shales, Ontario, 1983-84; M.Sc. theses (Loftsson, Senior).

Report on the mechanical behavior of Kettle Point oil shale is complete. The major scientific finding is that the strength and deformation properties are independent of the organic content, which can be up to 17% by weight. The quartz/illite ratio, however, is strongly correlated to properties: the more quartz, the stronger and stiffer the shales. New project to start in 1984: oil shales from various Canadian sources will be studied for mechanical behavior and mineralogy.

405. REEVES, M.J., Univ. Saskatchewan (Geological Sciences):
Characterization of fractured rock masses, 1983-85.

To characterize fractured rock masses by investigation of the orientation, interconnection and surface roughness of discontinuity planes. Properties under investigation include frictional strength, stiffness and permeability. Field and laboratory measurements of geometric parameters are being made in parallel with the development of numerical procedures to generate synthetic rock surface and connection networks. A model relating discontinuity surface geometry to frictional rock strength has been developed.

406. YU, Y.S., TOEWS, N.A., EMR (CANMET):
Modelling, 1980-.

See:

Strength of a mine pillar at Copper Cliff South Mine; CANMET MRL Rept. MRP/MRL 83-47 (TR), 1983.

The numerical modelling of the behaviour of a mine pillar at Copper Cliff South as part of a rock mechanics study of mine panel stability with support systems has been completed. The existing numerical package Mintab has been upgraded. Considerable effort has been placed on general software development for a new VAX 750 system and program conversion.

SOIL MECHANICS/MÉCANIQUE DES SOLS

407. HUGHES, O.L., Geol. Surv. Can.:
Surficial geology and land classification, Mackenzie Valley Transportation Corridor, 1971-.

408. LAW, K.T., BOZOZUK, M., EDEN, W.J., National Research Council of Canada (DBR):
Geotechnical properties – eastern marine clay, 1951-.

See:

Laboratory and field determination of preconsolidation pressures at Gloucester; Can. Geot. J., Vol. 20, no. 3, p. 477-490, 1983.

Field studies of landslides in clay. Settlement of buildings and fills on clay. Skin friction on piles in clay. Laboratory and in situ studies on stress-deformation characteristics of clays.

409. PENNER, E., National Research Council of Canada (DBR):
Frost action in soils, 1953-.

See:

Adfreezing stresses on steel pipe piles, Thompson, Manitoba; Proc. Fourth Internat. Conf. on Permafrost, Fairbanks, July 1983.

Frost heave and ice segregation; ibid., 1983.

Comparisions of modes of freezing are being currently investigated.

410. PENNER, L.A., REEVES, M.J., Univ. Saskatchewan (Geological Sciences):
The orientation and origin of fractures in Saskatchewan tills, 1983-85; M.Sc. thesis (Penner).

An attempt is being made to relate the orientation and intensity of the fracturing of tills in southern Saskatchewan to the stress histories of the deposit. Modelling studies are proceeding to define bounds for the stress magnitudes and directions responsible for the shear and tensile failure planes observed in the field. Data is being collected from sites where clear evidence of ice flow direction can be found. Laboratory testing of oriented cores are in progress to identify planes of weakness in apparently homogeneous tills. Shear box tests and unconsolidated undrained triaxial tests for cores cut in several orientations will be carried out.

411. SCHULZ, T.M., THOMSON, S., SEGO, D.C., SCOTT, D.J., HANKINS, P., Univ. Alberta (Civil Engineering):
Settlement of mine backfill in open pit mines, 1982-84; M.Sc. thesis (Hankins).

There are two main aims of this research project. The first is the time-settlement characeristics of open pit mine backfill including the time necessary for settlement to be essentially complete. The second aim is the design of foundation systems for light structures on mine backfill.

412. TIEDEMANN, C., THOMSON, S., Univ. Alberta (Civil Engineering):
Characterization of Edmonton tills using standard penetration test blow counts, 1983-84.

Part of a long term investigation of the glacial history of the Edmonton Area and an area study of the surficial soils deposited during the Wisconsin glacial period. Several individual investigations have been carried out for specific purposes by Quaternary geologists and geotechnical engineers. The long term project is to bring together all the available data to elicit a geologic model of deglaciation of the Edmonton area. The engineering characteristics of the deposits should reflect the glacial history and allow prediction of engineering behaviour for underdeveloped areas within the city and immediate environment.

413. TSUI, P.C., THOMSON, S., MORGENSTERN, N.R., Univ. Alberta (Civil Engineering):
Mechanics of ice-shoved bedrock, 1983-85; Ph.D. thesis (Tsui).

Glacial ice shore (or thrusting) of the poorly indurated bedrock of Western Canada is a ubiquitous feature. The feature may vary from overturned anticlinal structures to gentle folds. The disturbance may reach in depth to 30 m or more. From a geologic point of view the mechanics of the thrusting has not been determined, though several theories or postulates have been advanced. From an engineering point of view, the disturbed bedrock has suffered a significant decrease in its strength and deformation characteristics. The aim of the research is to clarify a mechanism of ice-shore and, hence, characterize the loss of shear strength and increase in deformation properties.

SNOW AND ICE/ NEIGE ET GLACE

414. FREDERKING, R.M.W., SINHA, N.K., SAYED, M., National Research Council of Canada (DBR):
Ice mechanics, 1960-.

See:

Ice behaviour around a small Arctic island; Proc. 7th Internat. Conf. on Port and Ocean Engineering under Arctic Conditions, Helsinki, vol. 2, p. 885-887, 1983.

To investigate the structural, rheological and mechanical properties of river, lake and sea ice; to observe ice forces on structures and the load bearing capacity of ice covers.

415. SCHAERER, P.A., MCCLUNG, D.M., National Research Council of Canada (DBR):
Avalanche engineering, 1966-.

See:

Determination of avalanche dynamics friction coefficients from measured speeds; Annals of Glaciology, vol. 4, p. 170-173, 1983.

To determine the characteristics of snow avalanches in motion, the amount of snow moved by avalanches, the feasibility of measures for avalanche protection and to develop techniques of evaluating avalanche hazard. To determine characteristics of snow and terrain parameters necessary for estimation of creep pressures on structures in deep snow covers.

416. BINDA, G., JOHNSON, P.G., Univ. Ottawa (Geography):
The suspended sediment discharge regime from Peyto Glacier, Alberta, 1981-84; M.S. thesis (Binda).

The suspended sediment discharge regime at the glacier terminus can be divided into three seasons. 1) The base flow early snow melt conditions with surface runoff from glacier and low sediment concentration. 2) A period of opening of glacier conduits with irregular flushing of sediments from the conduits during rising discharge. There is no relationship between discharge and sediment concentration with flushing peaks occurring on both rising and falling limbs of the hydrograph and at minimum daily discharges. 3) Late season period of ice melt with high discharge but lower more stable sediment concentrations following a diurnal regime with the hydrograph. Suspended sediment concentrations are glaciologically controlled and thus very difficult to predict. The onset and length of the components of the season vary considerably from year to year according to the regional climatic conditions and impacts on the regional hydrology.

417. JOHNSON, P.G., KENT, T., SCHWARTZBURG, R., Univ. Ottawa (Geography):
Glacier control of suspended sediment regime of Slims River, southwest Yukon, 1983-84.

The Slims River Delta into Kluane Lake has been prograding rapidly as a result of the sediment supply of the Slims River. The study was stimulated by the characteristics of Kluane Lake sedimentation investigated by National Water Research Institute (Vancouver) which required some understanding of the Slims River Sediment regime. Research at the Alaska Highway Bridge, 20 km from the Kaskawulsh Glacier, but at the apex of the delta demonstrated a highly variable regime which was difficult to analyse statistically. The season could be divided into three components. The early June with strongly diurnal hydrograph with a flat, low sediment concentration record. The late June-early July season with rising hydrograph and highly erratic sediment concentrations with peaks at 19 g/Litre. The late July-August season with the peak discharges but with a more regular diurnal sediment concentration regime. This is the same pattern experienced at the terminus of the Peyto Glacier, Alberta, and demonstrates that the suspended sediment and hydrological regime of the Slims River is glaciologically controlled.

418. KOERNER, R.M., FISHER, D.A., ALT, B., BOURGEOIS, J., PARNANDI, M., LANGLEY, K., Polar Continental Shelf Project (EMR):
Paleoclimate of Arctic Islands, 1970-.

See:

Synoptic analogs: a technique for studying climatic change in the Canadian High Arctic; Syllogeus, no. 33, p. 70-107, 1983.

Ice core study, a climatic link between the past, present and future; Syllogeus, no. 49, p. 50-69, 1983.

Effect of wind scouring on climatic records from ice-core oxygen isotope profiles; Nature, vol. 301, no. 5897, p. 205-298, 1983.

Laboratory investigations: A three-dimensional model of the 18 000 B.P. Laurentide Ice Sheet was computed in collaboration with N. Reeh of the University of Copenhagen; the work has been submitted for publication. A model of vapour transport and its relationship to oxygen isotope ratios in ice cores was developed. Work on the Northern Ellesmere pre-Holocene ice is almost completed. The study of regional variations of pollen rain the High Arctic continues and the analysis of pollen concentration in the northern Ellesmere core has been completed. Using a synoptic approach certain sections of the ice core time series were studied to assess the effect of variations in the ratio of warm to cold season snow accumulation on oxygen isotope values.

Field work: The mass balance of four Arctic ice caps was remeasured. On Agassiz ice cap on Northern Ellesemere Island bulk snow samples for pollen analysis were collected, borehole tilt and diameter remeasured and samples for graphite particle anlaysis by University of California were taken.

419. OSBORN, G.D., Univ. Calgary (Geology and Geophysics):
Dynamics of glacier bergschrunds, 1978-.

See:

Characteristics of the bergschrund of an avalance-core glacier in the Canadian Rocky Mountains; J. Glaciology, vol. 29, p. 55-69, 1983.

To gather fundamental information on the creation and maintenance of bergschrunds, to fill a gap in the understanding of glaciers. Problems such as controls on location, maintenance through the winter, and nature of ice/snow motion immediately above the bergschrund are being addressed by observations within bergschrunds, including seson-to-season and year-to-year observations, and monitoring ice motion with reference markers.

420. POWER, J.M., Environment Canada (National Hydrology Res. Instit.):
Peyto glacier hydrology, 1965-.

Monitoring of mass balance continued at this former IHD basin. Snow accumulation and ablation and meteorological measurements were conducted by Ottawa Univ. students under a contract to Dr. P.G. Johnson. G. Holdsworth employed a monopulse radar system to measure ice thickness at several locations on the tongue of the glacier and at one location in the accumulation zone. Measured depths were considerably higher than those arrived at in a much early survey.

HYDROGEOLOGY/HYDROGÉOLOGIE

421. BERNIER, P., AZZARIA, L.M., Univ. Laval (Géologie):
Spatial and time-variation of ground water quality of Lake Laflamme drainage basin, Parc des Laurentides, Québec, 1982-84; M.Sc. thesis (Bernier).

422. BORNEUF, D.M., Alberta Research Council (Groundwater):
Pine Lake research basin, Alberta, 1980-84.

High values of transmissivity and hydraulic conductivity are found in Paskapoo sediments of Tertiary age in the Pine Lake basin. Typically these high values of aquifer parameters are found in shallow, fractured, Paskapoo sandstones, regardless of elevation in the basin. Water quality improves with depth. Shallow bedrock aquifers display a water type reflecting that of the drift; relatively high sulfate content of the shallow aquifer probably originate from gypsum found in the drift.

423. BUCHANAN, P., KUCERA, R.E., Univ. British Columbia (Geological Sciences):
Mechanics of debris flow initiation in Whitcom county, Washington, 1983-84; M.Sc. thesis (Buchanan).

A high intensity rainfall was known to cause debris flows in shallow, study residual soils of Whatcom County, Washington. Nine small failures (maximum 300 m long) were chosen as representative of the many debris flows that occurred in the area. After an investigation of topography, soil characteristics, and other controlling factors an explanation of the mechanics of flow initiation for each slide is proposed. High rainfall intensity is known to be the principle triggering mechanism. Also, the hydraulic conductivity of the soil determines how quickly rainfall can penetrate the profile. To simulate the rainfall event a one dimensional, transient, finite difference infiltration model is utilized. Other soil properties such as internal friction in the sand and intial moisture conditions are important. Finally, the role of other factors such as bedrock gullies that concentrate water, soil pipes, logging roads, and vegetation types are discussed for each slide.

424. CHERRY, J.A., HUGHES, G.M., Ontario Ministry Environment (Waste Management Br.):
Occurrence and mobility of hazardous organic contaminants in groundwater at Ontario landfills, 1983-87.

To assess the migration and attenuation of organic contaminants that originate in landfills. Approximately seven landfill sites will be examined using multilevel piezometers.

425. FARVOLDEN, R.N., KARROW, P.F., GREENHOUSE, J.P., PEHME, P., ROSS, L., Univ Waterloo (Earth Sciences):
Study of subsurface Quaternary deposits using borehole geophysics, 1982-85; M.Sc. theses (Pehme, Ross).

To improve the resolution and usefulness of borehole geophysics in disciplining Quaternary stratigraphy of the Kitchener-Waterloo area. To date four holes have been logged in detail, two of them beside continuously cored holes for core-geophysics comparison. A calibration pit has been built on the University Campus, to allow standardization of tool responses. All the boreholes logged to date are cased and capped, and available for use with other tools as they become available. The major stratigraphic markers in the section, the Catfish and Maryhill tills, are now identifiable on the basis of their geophysial response.

426. FORSTER, C., SMITH, J.L., Univ. British Columbia (Geological Sciences):
Hydrologic factors in an exploration strategy for geothermal resources in the Coast Mountains of British Columbia, 1982-85; PH.D. thesis (Forster).

Geothermal exploration activities in the Coast Mountains have been hampered by the mountainous terrain, complex geology and high precipitation associated with this region. These factors have resulted in a number of difficulties in interpretation of geophysical, geochemical and heat-flow data. The primary goal of our research is to explore the mechanisms of heat transfer by groundwater circulation in fractured mountainous terrain. This will be accomplished through numerical modelling of idealized systems. Secondly, the insights gained from these studies will be used to provide geothermal explorationists with conceptual models of groundwater circulation in the Coast Mountains and methods of using these models in design of geothermal exploration strategies. Progress is underway in meeting the first goal of our study. Review of a number of existing computer models of geothermal systems suggests that the modelling principles are well understood. However, techniques for pre-production modelling of natural flow systems in fractured mountainous terrain have yet to be fully developed. We are in the process of modifying the most promising geothermal model to accomodate some of the characteristics unique to Coast Range geothermal systems. Following simulation of a number of idealized systems, model results will be compared with existing field data from the Meager Mountain geothermal prospect. In addition, a set of geothermal exploration guidlines will be developed from a hydrologic perspective.

427. FREEZE, R.A., GARVEN, G., Univ. British Columbia (Geological Sciences):
Theoretical analysis of the role of groundwater flow in the genesis of stratabound ore deposits, 1979-83; Ph.D. thesis (Garven).

428. FREEZE, R.A., SMITH, L.S., CASELTON, W., ANDERSON, D.L., PATTON, F.P., MASSMAN, J., Univ. British Columbia (Geological Sciences):
Risk assessment and design of data collection and monitoring networks at waste management sites, 1983-86; Ph.D. thesis (Massman).

429. GILLHAM, R.W., GOODWIN, M.J., Ontario Ministry Environment (Water Resources Br.):
Investigations of nitrate distribution and nitrogen transformations in a shallow sandy aquifer near Alliston, Ontario, 1982-85.

To assess the impact of nitrates on groundwater under heavily fertilized fields.

430. GOODWIN, M.J., SIBUL, U., Ontario Ministry Environment (Water Resources Br.):
Reconnaissance survey of the effects of agricultural pesticides on shallow aquifers in southern Ontario, 1984-85.

The objectives of the reconnaissance survey are: 1) to determine if detectable levels of agricultural pesticides are reaching the water table in shallow aquifers in the immediate vicinity of pesticide applications; and 2) to provide initial field data on the fluctuation and the lateral and vertical extent of any pesticides found in groundwater.

If pesticides are found in groundwater, then more detailed studies would be necessary to address the safety of drinking groundwater in areas of pesticide use.

431. HITCHON, B., BACHU, S., SAUVEPLANE, C.M., LYTVIAK, A.T., BORNEUF, D.M., ANDRIASHEK, L.D., Alberta Research Council (Groundwater, Alberta Geol. Surv.):
Hydrogeology of oil sands: Cold Lake area project (HOSCLAP), Alberta, 1982-84.

A study of the regional hydrodynamic and hydrogeochemical properties of the Cold Lake oil sands area, involving: 1) an examination of information relating to groundwater and formation water occurrence, flow and chemistry in the area, and subsequent development of a database for research purposes; 2) construction of three-dimensional graphic representations of aquifer and aquitard distribution together with a synthesis of available hydrodynamic and hydrogeochemical data; and 3) utilization of the database and hydrogeological boundary conditions to develop conceptual and computer models for use in evaluating possible effects of in situ recovery and waste disposal methods on local/regional groundwater conditions.

432. HITCHON, B., SAUVEPLANE, C.M., WALLICK, E.I., GUNTER, W.D., LYTVIAK, A.T., Alberta Research Council (Groundwater, Oil Sands Res.):
Assessmentof fluid-rock interaction during fluid injection in oil sands and heavy oil areas of Alberta and adjacent areas, 1983-84.

Problems related to the injection of fluids beneath the oil sands and heavy oil deposits of Alberta are not well understood. The project will identify potential problems through a literature search and a reconnaissance-level study of the geometry, lithology, hydrodynamic and hydrochemical aspects of selected injection aquifers. Selected potential injection fluids will be analyzed and computer manipulations made to identify possible water-rock reactions. Experiments will be carried out on possible organic-rock reactions specifically as related to the adsorption of organics on rocks in the potential injection aquifer. The study will identify future research needs with specific reference to water-organic-rock reactions during fluid injection beneath oil sands and heavy oil deposits.

433. HUGHES, G.M., Ontario Ministry Environment (Waste Management Br.), Gartner Lee Assoc. Ltd.:
Investigation of infiltration into landfills, southern Ontario, 1982-84.

Assess instrumentation to measure infiltration into landfills.

434. KELLER, C.K., VAN DER KAMP, G., CHERRY, J.A., Saskatchewan Research Council (Geology), Univ. Waterloo (Earth Sciences):
Groundwater flow in glacial tills, Saskatchewan, 1982-86; Ph.D. thesis (Keller).

A research project is underway, aimed at the detailed understanding of groundwater flow and chemistry in glacial tills in Saskatchewan. A research site has been instrumented. Well response, pumping tests and chemical and isotope analyses on waters have been carried out. The bulk permeability of the till is higher than the matrix permeability, suggesting fractures. The pattern of flow and water quality suggests that recharge is strongly depression focussed. Further work is planned.

435. LOTIMER, A.R., FARVOLDEN, R.N., Univ. Waterloo (Earth Sciences):
Groundwater hydraulics of the Greenbrook multiaquifer system, Kitchener, Ontario, 1982-84; M.Sc. thesis (Lotimer).

Two multilevel piezometers have been installed at Greenbrook, one in the centre of the wellfield where the drawdown is at a maximum, and the second halfway between the centre of the wellfield and the edge of the drawdown core where the influence of pumping reaches a minimum.

Data in the form of depth-pressure head curves from both locations demonstrate that a vertical gradient exists over the entire thickness of the system. This implies that recharge does indeed reach the main aquifers by leakage through overlying strata.

A shutdown-recovery test should enable us to measure the effects of pumping throughout the entire thickness of the system. Hoepfully, comparison of depth-pressure head curves obtained during the normal pumping schedule with those obtained during an extended period of recovery will provide direct and conclusive evidence on the hydraulic connection throughout the system and the source of recharge to the main aquifers. Attempts will also be made to apply a mathematical model in order to simulate the flow system.

436. MAATHUIS, H., VAN DER KAMP, G., Saskatchewan Research Council (Geology):
SRC observation wells in Saskatchewan, Canada: analysis of hydrographs, 1981-85.

Analyses include detailed investigation of seasonal and long-term trends, barometric and loading efficiency and earth tide effects. Main emphasis will be on the relationship between long-term groundwater level trends and climatic variations.

437. MARSH, P., Environment Canada (National Hydrology Res. Instit.):
Liard River thermal regime, Northwest Territories, 1983-86.

This study will investigate the thermal regime of the Liard-Mackenzie Rivers near their confluence, with the primary objective to improve our understanding of the rate of heat transfer by the Liard and Mackenzie Rivers, and the heat flux from the river water to the overlying ice cover. This study will concentrate on measuring water temperature and heat flux during the breakup period.

Initial field observatons were conducted during the 1983 spring breakup period. Detailed measurements of water temperature and related parameters were carried out beneath the solid ice cover prior to breakup. During breakup, water temperatures were obtained in open water sections within and at the upstream edge of the ice jams.

438. MARSH, P., Environment Canada (National Hydrology Res. Instit.):
Water balance, Mackenzie Delta lakes, Northwest Territories, 1983-87.

To determine the magnitude of the major components of water balance of a variety of lakes in the Mackenzie Delta in order to establish the processes controlling lake levels. This study will concentrate on: 1) measuring the evaporation rate from lakes and forested areas; 2) determining whether the lakes are connected to a sub-permafrost groundwater system; and 3) measurement of the other major components of the lake water balance. This will allow the determination of the relative importance of each water balance component and the sensitivity of the lake to changes in any of these components.

Initial field work during 1983 concentrated on a reconnaissance of the study area and the installation of equipment required to carry out the 1984 data collection program.

439. MCKENNA, F.P., SIBUL, U., Ontario Ministry Environment (Water Resources Br.):
The effect of fertilizers on shallow aquifers beneath agricultural lands, southern Ontario, 1984-85.

The use and quantity of organic and chemical fertilizers in argicultural areas in Ontario has increased significantly over the last few decades. The effect of fertilizer use on groundwater quality in shallow phreatic aquifers is to be examined by a well water sampling program in several high intensity agricultural areas.

440. MCKENZIE, F.B., Alberta Research Council (Groundwater):
The water balance of three urbanized drainage basins in Edmonton, Alberta, 1981-84; Ph.D. thesis.

To monitor the rainfall/runoff and compare the annual yield with annual consumption in the three urban drainage basins.

441. MICHEL, F.A., Carleton Univ. (Geology):
Hydrogeology of Penticton Tertiary outlier, British Columbia, 1983-84.

Groundwater samples were collected during May, September 1983 and February 1984 for chemical and isotopic analysis from surface waters, springs, domestic wells and diamond drill holes within the White Lake Basin. The diamond drill holes were sampled at various depths to examine variations in water Chemistry with depth. The data indicate that the groundwater flow systems can be divided into near surface flow in overburden and bedrock, and deep localized flow. The deep groundwaters are artesian and slow moving. These systems are probably bounded by faults throughout the area and discharge into the main Okanagan Valley via these faults.

442. PETRIE, J.M., FARVOLDEN, R.N., Univ. Waterloo (Earth Sciences):
Aquitard response to pumping of underlying aquifer, 1982-84; M.Sc. thesis (Petrie).

To monitor response of a leaky confined aquifer system. Earlier tests have established the hydraulic parameters for the aquifer ($T = 9 \times 10^{2}$ cm^2/min $S = 3 \times 10^{-3}$). A leakage factor was determined from one test.

The confining tills (40' of clay till – Maryhill and 40' of stony silt till – Catfish Creek) have been instrumented with 27 piezometers at two adjacent sites 150 m from a pumping well. Piezometer response tests show a range of hydraulic conductivities from 10^{-3} to 10^{-6} cm/sec. A steep downward hydraulic gradient is formed over the upper position of the aquitard, but much of the system is in hydraulic equilibrium with the underlying aquifer. We aim to determine aquitard performance during a 10 day pumping test from piezometer response as well as from the response of observation wells completed in the pumped aquifer.

443. STEIN, R., Alberta Research Council (Groundwater):
An investigation of hydrogeological processes influencing dryland salinity, Alberta, 1983-85.

Dryland salinity affects an estimated 500 000 acres of Alberta farmland. One cause of salt affected soils is known to be groundwater discharge but farming practices (summer fallowing, weed control) have been implicated for recent increases in soil salinity. Groundwater recharge/discharge processes are well understood in general terms, however, an understanding of these processes in quantitative terms is necessary for the design and implementation of effective salinity control methodology.

444. VAN DER KAMP, G., MAATHUIS, H., Saskatchewan Research Council (Geology):
Aquifer evaluation, Saskatchwan.

See:

Influence of a salt tailings pile on groundwater flow: A case history in Saskatchewan; Proc. 1st Internat. Potash Conf., p. 749-754, 1983.

To arrive at an improved understanding of groundwater in the hydrogeologic setting of Saskatchewan: includes studies of groundwater contamination around waste disposal ponds, numerical modelling studies to evaluate aquifer yields, studies of interactions between groundwater and heat flow with regard to geothermal energy and heat storage, studies of pump test methodology, well-field design, and groundwater chemistry.

445. VAN EVERDINGEN, D.A., FARVOLDEN, R.N., Univ. Waterloo (Earth Sciences):
Evaluation of surficial aquifier at Greenbrook wellfield, Kitchener, Ontario, 1983-84; M.Sc. thesis (van Everdingen).

To determine the extent and hydraulic properties of a shallow aquifer within the Greenbrook wellfield, Kitchener. Also, it is important to establish the relation between this shallow aquifer and a shallow sand under the Ottawa Street Landfill, only 500 ± m to the south of the wellfield. Contaminants have been identified in the groundwater near the landfill. The shallow aquifer at Greenbrook is a possible source of water for short term emergency use during summer droughts.

446. WALLICK, E.I., BALAKRISHNA, T.S., Alberta Research Council (Groundwater):
Hydrochemistry peatlands, Saulteaux River area, Alberta, 1983-86.

Project activities include acquisition of baseline surface water and groundwater hydrochemical data to determine impacts of peatland drainage for forestation, and evaluation of chemical effects resulting from mixing peat drainage water with the Saulteaux River.

447. WALLICK, E.I., BALAKRISHNA, T.S., SHAKUR, A.S., HUEMMERT, M., Alberta Research Council (Groundwater):
Hydrochemistry of the Twin Butte area: Evaluation of the potential degradation of groundwater quality due to sour gas plant operations, Alberta, 1983-84.

To characterize chemical and isotopic composition of groundwater and surface water; to characterize the geochemical interaction between water and the Quaternary deposits; to study the geochemical effects of So_2 on Quaternary deposits with regard to release of toxic heavy metals. The activities described provide high quality data and an objective approach to assist decision-makers in dealing with a real environmental problem or defuse a politically sensitive impediment to gas plant operation and development.

448. WOODBURY, A.D., SMITH, J.L., Univ. British Columbia (Geological Sciences):
The thermal effects of three-dimensional groundwater flow, 1982-83; M.Sc. thesis (Woodbury).

Numerical solutions of the coupled equations of fluid flow and heat transport are used to investigate how the thermal regime is perturbed by groundwater flow in a basin with a three-dimensional water table configuration. Simulations are carried out for a basin 40 km long, 20 km wide, and up to 5 km deep. Several different water table geometrices are considered, along with the effects of hydraulic anisotropy, depth of flow, and higher permeability zones. Results are presented primarily in the form of surface heat flow maps. For advectively-disturbed basins, surface heat flow reflects the spatial distribution and rate of groundwater recharge and discharge. Simple water table configurations can lead to complex variations in surface heat flow, even in basins with homogeneous permeability. Effects of large scale relief in a direction orthogonal to the regional topographic slope are important to recognize. Aquifers, while enhancing the thermal disturbance, tend to damp out the three-dimensional effect. Hydraulic an isotropy with a lower vertical than horizontal permeability subdues advective pertibations to the thermal regime and reduces the effects of a water table gradient transverse to the regional topographic slope.

MARINE GEOSCIENCE/OCÉANOGRAPHIE

449. BARRETT, T.J., YEH, H.-W., McMURTRY, G., TAYLOR, P., SCOTT, S.D., FRIEDRICHSEN, H., Univ. Toronto (Geology):
Elemental and isotope geochemistry of hydrothermal metalliferous deposits from spreading axes in the East Pacific, 1981-86.

A large analytical project has just commenced on metalliferous pelagic sediments from DSDP Leg 92, the East Pacific Rise transect. In the future, we will also be receiving metalliferous crust (recently dredged by the U.S. Geological Survey) for Pb-Sr isotopic analysis to determine the role of hydrothermal activity in providing these metals.

450. BLASCO, S.M., Geol. Surv. Can.:
Surficial geology of Lomonosov Ridge, Arctic Ocean, 1978-.

451. BUCKLEY, D.E., Geol. Surv. Can.:
Environmental geology of the deep ocean, 1979-.

452. FORBES, D.L., Geol. Surv. Can.:
Sediment dynamics and depositional processes in the Coastal Zone, 1982-.

453. JACKSON, H.R., Geol. Surv. Can.:
Surficial geology and crustal structure of the Alpha Ridge, Arctic Ocean, 1981-.

454. JOSENHANS, H.W., Geol. Surv. Can.:
Surficial geology, geomorphology and glaciology of the Labrador Shelf, 1981-.

455. LEWIS, C.F.M., Geol. Surv. Can.:
Ice scouring of Continental Shelves, 1979-.

456. LOGAN, A., Univ. New Brunswick, Saint John (Geology):
Deep-water hard substrate benthic communities, Head Harbour Passage, Bay of Fundy, 1982-85.

457. LOGAN, A., Univ. New Brunswick, Saint John (Geology):
Interspecific competition in corals from Bermudian Holocene reefs; 1982-85.

458. MACLEAN, B., Geol. Surv. Can.:
Eastern Baffin Island shelf bedrock and surficial geology mapping program, 1976-.

See:

Geological investigations of Baffin Island shelf in 1982; Geol. Surv. Can., Paper 83-1B, p. 309-315, 1983.

459. MAH, A., STEARN, C.W., McGill Univ. (Geological Sciences):
Effects of Hurricane Allan on a fringing reef, Barbados, W.I., 1981-84; M.Sc. thesis (Mah).

See:

The effects of a hurricane on a fringing reef; Geol. Soc. Amer., Program with Abstracts, vol. 15, p. 186, 1983.

460. ORTIZ, T., STEARN, C.W., McGill Univ. (Geological Sciences):
Origin and environment of closed depressions west of the Bellairs fringing reef, Barbados, 1981-84; M.Sc. thesis (Ortiz).

461. PIPER, D.J.W., Geol. Surv. Can.:
Quaternary geologic processes on Continental slopes, 1981-.

462. ROBINSON, P.T., HALL, J.M., MALPAS, J., Dalhousie Univ. (Centre for Marine Geology), Memorial Univ. (Earth Sciences):
Cyprus crustal study project, 1981-87.

See:

Volcanic glass compositions of the Troodos Ophiolite; Geology, vol. 11, p. 400-404, 1983.

Troodos extrusive series of Cyprus; a comparision with ocean crust; ibid., p. 405-409, 1983.

To determine the origin and rule of emplacement of the Troodos Ophiolite in order to test the ophiolite model for oceanic lithosphere. We also are comparing the ore deposits of the Troodos Ophiolite with "Black Smoker" deposits presently being formed along modern spreading areas. From the work completed thus far we believe, that the Troodos Ophilite was formed in a subduction zone environment and that it was emplaced largely by vertical uplift.

463. SCHAFER, C.T., Geol. Surv. Can.:
Continental slope geologic processes off Newfoundland and Labrador, 1978-.

See:

The Newfoundland Slope at 49-50°N: nature and magnitude of contemporary marine geological processes; Geol. Surv. Can., Paper 84-1A, p. 563-566, 1984.

464. TAYLOR, R.B., Geol. Surv. Can.:
Coastal environments and processes in the Canadian Arctic Archipelago, 1982-.

MINERAL/ENERGY GEOSCIENCE/SCIENCES DE LA TERRE APPLIQUÉES AUX MINÉRAUX ET À L'ÉNERGIE

COAL GEOLOGY/ GÉOLOGIE DU CHARBON

465. CAMERON, A.R., Geol. Surv. Can.:
Petrographic examination of coking coals from the Kootenay Formation, Alberta and British Columbia, 1961-.

466. CAMERON, A.R., Geol. Surv. Can.:
Petrographic analysis of Saskatchewan lignites, 1972-.

467. CAMERON, A.R., Geol. Surv. Can.:
Relationship of reflectance to chemical rank parameters of western Canadian coals, 1979-.

468. CAMERON, A.R., Geol. Surv. Can.:
Regional coal rank variations in the Kootenay Formation and their relationship to the structural history of the southern Canadian Rocky Mountains, British Columbia-Alberta, 1981-.

469. CAMERON, A.R., Geol. Surv. Can.:
Petrographic analyses of coals in the Saunders Group, Outa Foothills Belt, Alberta, 1983-.

470. DAWSON, F.M., Geol. Surv. Can.:
Resource evaluation and geology of coal deposits of western Canada, 1976-.

471. GOODARZI, F., Geol. Surv. Can.:
Compositional characteristics of coals from Hat Creek, British Columbia, 1977-.

472. GOODARZI, F., Geol. Surv. Can.:
Mineral matter and trace element content of Canadian coals, Alberta, 1978-.

473. GRIEVE, D.A., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Correlation of coal measures in the Fernie Basin, 1975-86.

See:

Tonsteins: Possible stratigraphic correlation aids in East Kootenay coalfields; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 36-41, 1984.

Continuing efforts to define coal quality and correlatable units associated with Cretaceous coal measures in the Fernie basin. Tonsteins have been recognized in the succession; their potential in correlation is being evaluated.

474. HACQUEBARD, P.A., Geol. Surv. Can.:
Rank and petrographic studies of coal and organic matter dispersed in sediments, 1968-.

See:

Geological and geothermal effects on coal rank variations in the Carboniferous basin of New Brunswick; Geol. Surv. Can., Paper 84-1A, p. 17-28, 1984.

475. HUGHES, J.D., Geol. Surv. Can.:
Resource evaluation and geology of Canada's coal deposits, 1981-.

476. HYDE, R.S., HISCOTT, R.N., BURDEN, E.T., WRIGHT, J.A., MILLER, H.G., SOLOMAN, S. PEAVEY, S., PAL, B.K., Memorial Univ. (Earth Sciences):
Fossil fuel potential of Carboniferous Basins, western Newfoundland, 1982-85; M.Sc. theses (Soloman, Peavey), Ph.D. thesis (Pal).

Work will continue on thermal maturation aspects of the basin using vitrinite reflectance and clay mineralogy. A start has been made on studying drillcore through part of the Barachois Group (coal-bearing). This work entails aspects of sedimentology, stratigraphy, and sedimentary petrology.

477. JERZYKIEWICZ, T., Geol. Surv. Can.:
Sedimentological studies of coal-bearing Upper Cretaceous and Paleocene formations, central Alberta Foothills, 1981-.

478. KALKREUTH, W.D., Geol. Surv. Can.:
Optical properties of coals and dispersed organic materials, 1975-.

479. KALKREUTH, W.D., Geol. Surv. Can.:
An investigation of the semi-inert constituents of western Canadian coals, 1979-.

480. KALKREUTH, W.D., Geol. Surv. Can.:
Evaluation of liquefaction potential of low rank coals and peats, 1981-.

See:

Petrography of feed coals and residual materials from liquefaction experiments; Geol. Surv. Can., Paper 83-1B, p. 397-400, 1983.

481. KALKREUTH, W.D., Geol. Surv. Can.:
Regional coalification studies in the Minnes, Bullhead and Fort St. John groups, northeastern British Columbia, 1981-.

482. KILBY, W.E., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Northeast British Columbia tonsteins/bentonites, 1983-85.

See:

Tonsteins and bentonites in northeast British Columbia (93O, P, 1); British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 93-107, 1984.

The study will be expanded both areally and stratigraphically in 1984. Core of the Gething, Moosebar and Gates Formations from most areas in the coalfield will be examined. Chemistry of samples will be examined in an attempt to identify the horizons chemically. K/Ar dating will be attempted on several of the more continuous horizons.

483. KILBY, W.E., LEGUN, A., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Northeastern British Columbia coalfield map compilation, 1:50 000, 1983-85.

Preliminary compilation completed in 1983, final verification of maps continuing through 1984. One sheet had extensive field mapping completed during 1983 season. Some sheets out as open files in 1984, rest in 1985.

484. KOO, J., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geoscientific evaluation of Telkwa and Red Rose coal measures in northwestern British Columbia, 1982-85.

485. KOO, J., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geoscientific evaluation of Klappan coal measures in northwestern British Columbia, 1983-85.

See:

The Telkwa, Red Rose, and Klappan coal measures in northwestern British Columbia; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 81-90, 1984.

To reveal the stratigraphy, structural development, depositional environments, and the geologic age of the Klappan coal measures; the correlation of coal seams and their quality, rank, and number; the areal extent of the coal measures and their relationships to surrounding rocks; coal reserves; geologic relationships of the coal measures to other major coal measures in northwestern British Columbia; regional and local exploration models.

486. McCABE, P.J., Alberta Research Council (Geol. Surv.):
Coal geology of Horseshoe Canyon Formation, southern Alberta, 1983-85.

487. NANDI, B.N., MacPHEE, J.A., CIAVAGLIA, L.A., EMR (CANMET):
Oxidation studies and alkane distribution of eastern and western Canadian coals, 1977-1986.

See:

Effects of oxidation on the chemical nature and distribution of low temperature pyrolysis products from bituminous coals; FUEL, vol. 62, p. 395, 1983.

Photoacoustic infrared fourier transform spectroscopy in the study of the oxidation of bituminous coals; Proc., Internat. Conf. on Coal Sci., Pittsburg, Aug. 15-19, 1983.

Studies in coal weathering/oxidation will be continuing over the coming three years at least due to the application of new techniques and instrumentation in this area. Among these TGA (thermogravimetric analysis) ^{13}C NMR with magic angle spinning, secondary ion mass spectrometry (SIMS) and Fourier transform infrared (FTIR). Work is in progress using all these techniques and appears promising.

488. NURKOWSKI, J.R., Alberta Research Council (Geol. Surv.):
Geology and coal resources of the Scollard Member, central alberta, 1982-85.

See:

Coal quality, coal rank variation and its relation to reconstructed overburden, Upper Cretaceous and Tertiary Plains coals, Alberta, Canada; Bull. Amer. Assoc. Petrol. Geol., vol. 68, no. 3, p. 285-295, 1984.

489. RICKETTS, B.D., Geol. Surv. Can.:
Studies of coal basins of western and northern Canada, 1977-.

490. SMITH, G.G., Geol. Surv. Can.:
Resource evaluation and geology of coal deposits of western and northern Cnada, 1983-.

491. TELFORD, P.G., Ontario Geol. Surv.:
Lignite resource assessment, Moose River Basin, James Bay Lowland, Ontario.

492. ZODROW, E.L., Univ. College of Cape Breton (Geology):
Trace-element study in Cape Breton coals, Sydney Coalfield, Nova Scotia, 1977-85.

See:

Some geochemical aspects of sedimentary rocks in proximity of coals, Sydney Coalfield (Upper Carboniferous), Cape Breton Island, N.S., Canada; Internat. J. Coal Geology, vol. 2, p. 299-320, 1983.

The statistical distribution of concentrations of (syngenetic) uranium in coals (7 coals seams, 12 channel samples; sample size: 107) is very skewed and it was found that the Pearsonian Type I function, although a J-shaped kind not commonly followed by geochemical variables, provided an adequate sample representation. The skewness in the statistical distribution is associable, to the first approximation, with records of sedimentary regression/transgression in a cyclical setting. The mean for uranium is 0.26 ppm and the variance 0.101 ppm

INDUSTRIAL MINERALS/SUBSTANCES MINÉRALES INDUSTRIELLES

493. AUBERTIN, R., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire de minéraux industriels dans la région de l'Outaouais, Québec, 1984-85.

Recherche et compilation d'indices où de gîtes potentiels de minéraux industriels. Examen et evaluation préliminaire de gîtes ou indices sélectionnés.

494. BATTERSON, M.J., BRAGG, D.J., ATKINSON, J., Newfoundland Dept. Mines and Energy:
Inventory of aggregate resources: regional survey – Newfoundland and Labrador, 1978-84.

See:

Inventory of aggregate resources in Newfoundland and Labrador; Newfoundland Dept. Mines and Energy, Min. Devel. Div., Rept. 83-2, 1983.

This project has, within the last year, expanded on the base established during previous years. Four major areas of investigation may be identified: 1) Aggregate resource data from within a 6 km corridor along known and proposed transportation routes within the province is now available on maps (1:50 000). Coloured aggregate resources maps at the 1:250 000 scale have been compiled and released. Data includes aggregate resource identification, pit and quarry location and sample locations; 2) The coverage of surficial landform map information has been extended to correspond to those areas covered by the aggregate resource data. Air photograph interpretation is now complete and drafting of maps is an ongoing process. Copies of these maps are available at a 1:50 000 scale; 3) Compilation of lithological information covering the outlined areas within Newfoundland-Labrador is in its final stages of completion. A series of 29 1:250 000 scale maps, plus marginal notes will outline bedrock data from a geotechnical viewpoint, in order to supplement and enhance the aggregate and surficial data; and 4) The expansion of the aggregate resource data base, the SIR (Scientific Information Retrieval) system, has been a continuous part of the project. To date 30 000 pieces of data have been collected for over 10 000 sites across the province. This data is now available upon request in a variety of formats and includes grain-size distribution curves, lithological data and petrographic numbers, as well as detailed sites and sample information.

495. BOEHNER, R.C., GILES, P.S., Nova Scotia Dept. Energy and Mines:
Salt and potash resource data compilation, Nova Scotia, 1977-.

See:

Windsor Group salt and potash in Nova Scotia, Canada; Sixth Internat. Symp. on Salt, 1983.

A compilation publication and map on the Salt and Potash resources of Nova Scotia is to be published in 1984. Compilation of newly generated data and assimilation of old data continues.

496. BUTEAU, P., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire des tourbieres de l'Abitibi, Québec, 1984-85.

Cerner les groupements végétaux et établir la stratification des dépots de tourbe. Evaluer qualetativement et quantitativement les dépots. Définir les zones a potentiel economique.

497. CHRISTIE, R.L., Geol. Surv. Can.:
Geology of bedded phosphate deposits in Canada, 1976-.

498. EDWARDS, W.A.D., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Carrot Creek area, Alberta, 1983-84.

Aggregate resource study of the 1:50 000 NTS sheet 83G/12 (Carrot Creek) area, Alberta surveyed in 1983.

499. EDWARDS, W.A.D., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Drumheller area, Alberta, 1983-84.

500. EDWARDS, W.A.D., HUDSON, B., Alberta Research Council (Geol. Surv.):
Aggregate supply and demand study, east-central Alberta, 1982-84.

501. FOX, J.C., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Hinton-Edson area, Alberta, 1983-84.

502. FUZESY, L.M., Saskatchewan Geol. Surv.:
Geology of the potash ore of the Middle Devonian Prairie Formation, Saskatchewan, 1981-84.

503. GULIOV, P., Saskatchewan Geol. Surv., Saskmont Engineering Ltd.:
Buffalo Narrows fuel peat production and utilization demonstration project, 1982-84.

Directed toward the demonstration of existing technology of fuel peat bog development, extruded sod production and the utilization of fuel peat for domestic heating. Approximately 8 tonnes of sod peat fuel was produced from an experimental bog near Buffalo Narrows during 1982. The fuel was to be used for heating in several homes and the municipal garage in Buffalo Narrows during the winter of 1982-83. The final report will be completed by March 31, 1984.

504. HAMILTON, W.N., Alberta Research Council (Geol. Surv.):
Mineral resource studies, 1979-.

Activities in 1983 were directed toward compilation of a mineral deposits map of Alberta and documentation of individual deposits into a mineral deposit file. The map and file are both about 50 percent complete for the 350 deposits known to exist.

505. HÉBERT, Y., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire des gisements de talc et steafite des Cantons de l'Est du Québec, 1984-85.

Etudier le contexte géolgoique et structural des dépots de talc associés a la ceinture ophiolitique des Cantons de l'Est. Examen et évaluation systématique des gîtes ou indices cannus.

506. HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Sand and gravel study – populated areas and transportation corridors, British Columbia, 1978-84.

Inventory of aggregate potential throughout the interior of British Columbia along major highways and around population centres.

507. HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Barite deposits of British Columbia, 1980-84.

Inventory of barite deposits in British Columbia. Compilation of available data, some limited field reconnaissance.

508. HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Silica resources of British Columbia, 1981-83.

Inventory of silica resources for industrial use. Property examinations of major veins, pegmatite plugs and quartzite beds.

509. HOWSE, A.F., DEAN, P.L., Newfoundland Dept. Mines and Energy:
Evaluation of Newfoundland's barite deposits, 1982-84.

See:

Barite evaluation in three areas of southeastern Newfoundland; Newfoundland Dept. Mines and Energy, Min. Devel. Div., Rept. 84-1, 1984.

Barite evaluation – eastern and western Newfoundland; ibid., Rept. 83-1, p. 150-156, 1983.

An assessment of Newfoundland's barite potential continued during 1983. Work concentrated mainly in two areas: the eastern Avalon isthmus, and the St. Brides area of the Cape Shore, from Cape St. Mary's to Angels Cove. Geochemical stream sediment and prospecting surveys were carried out in both areas. Several new barite veins were identified. The results of the stream sediment survey will be released on open file early in 1984.

510. KIRBY, F.T., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
Detailed aggregate assessments in Newfoundland, 1982-.

The 1983 program (as in the previous year) was aimed at locating, mapping and sampling sources of aggregate potential within a number of municipal planning areas throughout the island of Newfoundland. The work in 1983 was able to locate areas of aggregate within a number of municipal planning areas, and as a result these areas have been protected under the new municipal plans being developed for these areas.

Mapping was conducted at a scale of 1:50 000, but where sample densities dictated, larger scale 1:12 500 or larger maps were utilized. Backhoe test-pitting was used extensively to help determine the stratigraphic characteristics and the estimated depth of each deposit for quantity estimates. Particle size analyses and lithological analyses were conducted on collected samples.

511. LOCAT, J., CHAGNON, J.Y., Québec Ministère Énergie et Ressources:
Inventaire des ressources en granulats de la région de Québec, 1984-85.

Etude et caractérisation comme source de granulats des dépots de roches massives et de sable et gravier dans la région de Québec. Définir et mettre au point une méthode d'inventaire applicable aux autres regions du Québec.

512. MACDONALD, D.E., MORTON, R.D., Alberta Research Council (Geol. Surv.), Univ. Alberta (Geology):
Phosphate evaluation study, Alberta, 1978-84; M.Sc. thesis (MacDonald).

Project now completed and the final report is in the final editing stages.

513. NANTEL, S., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Evaluation de complexes ignis pour la pierre de taille, 1984-85.

Identifier des zones potentielles pour l'Exploitation de pierre de taille à des fins architecturales ou ornemantales.

514. RICHARDSON, R.J.H., Alberta Research Council (Geol. Surv.):
Aggregate resoruces of the area north of Grande Cache, Alberta, 1983-84.

One of a series of reconnaissance-level aggregate potential maps (at a scale of 1:250 000) derived primarily from existing surficial geology information and limited field checking.

515. RICKETTS, M.J., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
The coastal Labrador aggregate resource inventory, 1983-85.

The project was carried out in the communities of Lodge Bay, Mary's Harbour, Williams Harbour, Port Hope Simpson, Charlottetown, Paradise River, Black Tickle, Cartwright, Rigolet and surrounding areas.

The study consisted primarily of surficial airphoto interpretation followed by field mapping and sampling. Data were gathered on landforms and stratigraphy as well as a field description of the sample and deposit types. Particle size and lithological anlaysis of the materials were also conducted.

The location of samples and deposits were mapped onto 1:50 000 topographic base maps and are summarized for publication at a 1:250 000 scale. Surficial geology (landform or geomorphology) maps were produced at 1:50 000 scale.

Future work will include field investigation in coastal Labrador areas north of Melville Inlet and detailed sampling in the communities of Nain, Davis Inlet, Postville, Makkovik and the proposed relocation site for Hopedale.

516. RILEY, J.L., Ontario Geol. Surv.:
Peatland inventory project, Ontario, 1981-87.

See:

Peatland Inventory Project; Ontario Geol. Surv., Misc. Paper 116, p. 115-121, 1983.

During 1983, various reports on the previous year's field studies were released and field studies were undertaken in a further seven study areas; Rainy River, Ignace, Foleyet, New Liskeard, Parry Sound, Ottawa-Brockville, Kingston-Belleville.

517. SHAM, P., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Camrose area, Alberta, 1982-84.

One 1:50 000 NTS Sheet near Camrose, Alberta was surveyed in 1982.

518. SHAM, P., Alberta Research Council (Geol. Surv.):
Aggregate resources of the Edson area, Alberta 1983-84.

One 1:50 000 NTS Sheet near Edson, Alberta was surveyed in 1983.

519. SOLES, J.A., EMR (CANMET):
Stability of aggregates and cement-aggregate reactivity in concrete, 1965-86.

520. TREMBLAY, A., JACOB, H.L., CIMON, J., Québec Ministère Énergie et Ressources:
Inventaire du graphite au Québec, 1984-85.

Compilation, inventaire et évaluation préliminaire des principaux gites et indices connus au Québec. Etude du contexte géologique et structural de sites sélectionnés.

MINERAL DEPOSITION EXPLORATION/ EVALUATION/RECHERCHE ET ÉVALUATION DES GÎTES MINÉRAUX

521. ALLDRICK, D.J., CARLYLE, L.W., McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geology of the Mosquito Creek Gold Mine (NTS 93H), British Columbia, 1982-84.

See:

The Mosquito Creek Mine, Cariboo gold belt (NTS 93H/4); British Columbia Ministry Energy, Mines, Petrol. Res., Paper 83-1, p. 99-112, 1983.

Continuing studies include ore and host rock petrology, geochemical relationships and radiometric dating.

522. ALLDRICK, D.J., SINCLAIR, A.J., ARMSTRONG, R.L., GODWIN, C.I., Univ. British Columbia (Geological Sciences):
Metallogenesis of the Stewart Mining Camp, British Columbia (NTS 104B/1), 1983-87; Ph.D. thesis (Alldrick).

See:

Geologic setting of the precious metal deposits in the Stewart area (104 B/1); British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 149-164, 1984.

Geology of the Prosperity/Porter Idaho silver deposits (103 P/13); ibid., p. 165-172, 1984.

The Stewart mining camp has produced over 5.5 million tonnes of gold-silver ± base metal ore over the past 75 years. The current producer in the area is Scottie Gold mine and the major past-producer was the Silbak Premier mine.

The many ore deposits and mineral prospects of the area show wide variations in ore mineralogy, gangue mineralogy, alteration mineralogy and structural setting, but all are hosted in andesitic tuffs of the Jurassic Hazelton Group along the eastern margin of the Coast Plutonic Complex. In addition to intense alteration localized around the mineral deposits, the andesites have been overprinted by a complex pattern of regional alteration.

Planned research will investigate: 1) the characteristics of the major types of mineral deposits and the relationships between deposits; 2) the stratigrahic and structural settings of the deposits; 3) the characteristics and distribution of local and regional alteration patterns; and 4) the timing of mineralization with respect to host volcanics, regional alteration, intrusions of the coast plutonic complex and regional metamorphism.

523. BARRETT, T.J., ANDERSON, G.M., LUGOWSKI, J., Univ. Toronto (Geology):
The solubility of sphalerite and galena in high-concentration NaCl brines, 1984-85.

We are planning to examine Cu-Fe sulphide solubilities in the NaCl brine systems, and eventually the solubilities of the precious metals Pt, Ag and Au.

524. BEAUDOIN, A., PERRAULT, G., École Polytechnique (Génie minéral):
Géochimie du gîte d'or Dest Or, Québec, 1983-84; M.Sc.A. (Beaudoin).

Trouver les principaux paramètres géochimiques des gîtes d'Or de la Mine Dest Or. A ce jour, on note un halo endogène d'or important autour du gîte en exploration. Nous préparerons une publication en 1984 sur le sujet.

525. BELL, R.T., Geol. Surv. Can.:
Geology of uranium resources of Canada, 1975-.

526. BOUCHER, M., GAUTHIER, M., Univ. Québec à Montréal (Sciences de la Terre), Québec Ministère Énergie et Ressources:
Métallogénie du plomb-zonc de la région de Dunham, 1983-85; M.Sc. (Boucher).

Mettre en évidence des métallotectes.

527. BOUCHER, M., GAUTHIER, M., Univ. Québec à Montréal (Sciences de la Terre), Québec Ministère Énergie et Ressources:
Mineralisations plombo-zinciferes de la dolomie de Dunham, Estrie, Québec, 1983-85; M.Sc. (Boucher).

Voir:

Minéralisations plombo-zinciferes de la region de Durham, comté de Missisquoi; Québec Ministère Énergie et Ressources, DP 84-07, 1984.

Étude de la genèse de mineralisations plombo-zinciferes localisées dans une dolomie cambrienne. Cette étude porte également sur la stratigraphie et la sédimentologie de la Formation Hôte. Cette minéralisation est située au Front des Appalaches tout comme celle du Tennesse ou de Terre-Neuve (Daniel's Harbor).

528. BRASSARD, B., GAUTHIER, M., Univ. Québec à Montréal (Sciences de la Terre):
Gîtologie des indices de curve de la region du Lac Musset, Fosse du Labrador, Québec, 1982-84; M.Sc. (Brassard).

Voir:

Giftologie des indices de cuivre du Lac Musset, Fosse du Labrador; Québec Ministère Énergie et Ressources du DP-84-04, 1983.

Projet quais-achieve etude de la genèse d'un gite cuprifere (±uranifere) à Fort Tonnaga (100 Mt) et Faible teneur (0, 25% Cu) localisé dans un dyke de gabbro du groupe de Montaguais. Ce projet porte entre autré sur le controle structural de la minéralisation et sur les processes d'altèrations qui ont sunit sont depôt.

529. BRASSARD, B., GAUTHIER, M., CIMON, J., CLARK, T., Univ. Québec à Montréal (Science de la terre), Québec Ministère Énergie et Ressources:
Giftologie d'un gîte cuprifère au Lac Musset, Fosse du Labrador, Québec, 1982-84; thèse de maîtrise (Brassard).

Voir:

Giftologie des indices de cuivre du Lac Musset, Fosse du Labrador; Québec Ministère Énergie et Ressources, DP 82-34, 1983.

Définition des controles de la minéralisation franelle et des autres minéralisations cuprifères de la région; evaluation préliminaire du potentiel économique des autres indices dans le secteur.

530. BURTON, D.M., McALLISTER, A.L., Univ. New Brunswick (Geology):
Geology of Cam. Brancroft uranium deposit, Ontario, 1978-84; M.Sc. thesis (Burton).

531. CHAINEY, D., PERRAULT, G., MAKILA, A., École Polytechnique (Génie minéral):
Paramètres géochimiques de la minéralisation aurifère de la mine Camflo, Québec, 1980-83; M.Sc.A. (Chainey).

532. CHERRY, M.E., COLVINE, A.C., Ontario Geol. Surv.:
The association of gold and felsic intrusions, 1982-86.

A continuing investigation of the significance of the association of lode gold deposits with felsic intrusions, with emphasis on the Abitibi greenstone belt. The study includes: petrography, petrochemistry, radiometric age-dating, fluid inclusion studies and stable isotope determinations.

533. CHEVÉ, S., TRZCIENSKI, W., BROWN, A.C., École Polytechnique (Génie minéral):
Metallogeny of volcanogenic Cu-Zn mineralization in the Megantic region, Eastern Townships, Quebec, 1978-83; Ph.D. thesis (Chevé).

See:

Petrology of the Frontenac metabasites: its tectonic bearing in Quebec and adjacent New England; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 52, 1984.

Determination of the regional and local environments of copper-zinc deposits of volcanogenic origin in the volcano-sedimentary series of the Lake Megantic region, Quebec.

534. CHURCH, B.N., British Columbia Ministry Energy, Mines, Petrol. Res., (Geol. Br.):
Geology of the Greenwood area, British Columbia.

See:

Geology and self potential survey of the Sylvester K gold-sulphide deposit; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, 1984.

Geology and magnetometer survey of the Sappho gold-silver-platinum-copper prospect; British Columbia Energy, Mines, Petrol. Res., Paper 1983-1, p. 27-31, 1983.

Geological mapping on a scale of 1:24 000 and in more detail around existing and extinct mines to aid the understanding of ore controls and define exploration targets.

535. CLARK, T., CIMON, J., Québec Ministère Énergie et Ressources:
Giftologie du centre-nord de la fosse du Labrador (région des lacs Mistamisk-Romanet-Otelnuc-Patu), Québec, 1982-85.

Le projet vise la caractérisation des indices mineralisés de métaux de base et d'uranium de la région et une connaissance des métallotectes; les travaux comprennent de la cartographie à 1:20 000, 1:10 000 et plus détaillée, de l'echantillonnage, et diverses études de Laboratoire.

536. DAIGNEAULT, R., PERRAULT, G., BEDARD, P., École Polytechnique (Génie minéral):
Géologie et géochimie de la mine Lamaque, Val d'Or, Québec, 1980-84; M.Sc.A. (Daigneault).

Voir:

Géologie et géochimie de la mine Lamaque, Val d'Or, Québec; Bull. C.I.M., mars 1983.

La première partie de ce travail a été publiée: elle établit les relations entre les petits plutons de tonalité et de diorite de la mine Lamaque aux autres intrusifs ainsi qu'aux empilements volcaniques. Ce travail a débouché sur un autre projet de recherche sur la dispersion de l'or autour des gîtes minéraux à la Mine Lamaque.

537. DARLING, R., École Polytechnique (Génie minéral):
Geology of the manganese occurrences in the Schefferville region, Quebec.

538. desRIVIÈRES, J., BROWN, A.C., École Polytechnique (Génie minéral):
Metallogeny of a gold prospect, Lac Chicobi area, Abitibi belt, Quebec, 1983-84; M.Sc.A. thesis (desRivières).

Characterization of vein-type gold mineralization and alteration halos, Lac Chicobi area, Québec.

539. DiLABIO, R.N.W., Geol. Surv. Can.:
Drift prospecting methods and models, 1978-.

540. DUKE, J.M., Geol. Surv. Can.:
Chromium resources in Canada, 1980-.

541. DUNSMORE, H.E., Geol. Surv. Can.:
Geology of uranium resources of Canada, 1976-.

542. DUSSAULT, C., DARLING, R., École Polytechnique (Génie minéral):
Ore mineralogy, Ferderber Zone, Belmoral Mine, Quebec, 1983-85; M.Sc.A. (Dussault).

543. ECKSTRAND, O.R., Geol. Surv. Can.:
Geology of Canadian nickel and platinum group deposits, 1963-.

544. GAGNON, R., GOULET, N., CIMON, J., CLARK, T., Univ. Québec à Montréal (Sciences de la Terre); Québec Ministère Énergie et Ressources:
Giftologie des gîtes polymétalliques de la région du lac Gerido, fosse du Labrador, Québec, 1983-84; thèse de maîtrise (Gagnon).

Le projet vise une meilleure connaissance es caractéristiques et de la mise en place des gîtes polymétalliques de la région. Les travaux comprennent des études comparatives, des analyses structurales, des etudes de minéralogie et de pétrochimie.

545. GANDHI, S.S., Geol. Surv. Can.:
Geology of uranium resources of Canada, British Columbia – District of Mackenzie, 1977-.

See:

Age and origin of pitchblende from the Gunnar deposit, Saskatchewan; Geol. Surv. Can., Paper 83-1B, p. 291-297, 1983.

Origin of pitchblende veins in the Union Island area, Great Slave Lake, Northwest Territories; ibid., p. 317-326, 1983.

546. GAUTHIER, M., HÉBERT, L.D., TROTTIER, J., BOISVERT, D., PRUD'HOMME, S., LAMARCHE, R., BROWN, A.C.., Univ. Québec a Montréal (Sciences de la Terre), INRS-Géoressources, École Polytechnique (Génie Minéral):
Synthèse métallogénique de l'Estrie et de la Beauce, Québec, 1983-88; M.Sc. (Hébert, Prud'homme), thèse de doctorat (Trottier).

Projet de synthese métallogenique de l'Estrie et de la Beauce dans les Appalaches du Québec. Ce projet comprend le reexamen de taillé de tout les indices métalliferir compris dans ce secteur des Appalaches. Ce projet est actuellement en phase de démarrage.

547. GROSS, G.A., Geol. Surv. Can.:
Geology and evaluation of iron and manganese resources, 1957-.

548. HALE, W.E., Univ. New Brunswick (Geology):
Controls for gold mineralization at the Forest Hill Mine, Guysborough County, Nova Scotia, 1981-86.

549. HASAN, M., ZENTILLI, M., MACINNIS, I., Dalhousie Univ. (Geology):
Base metal, gold and tungsten mineralization associated with manganiferous meta-sediments (coticules) in the Meguma Group of Nova Scotia, 1983-87; Ph.D. thesis (Hasan).

See:

The Goldenville-Halifax transition of the Meguma Group as a control for metallic mineralization; Geol. Soc. Amer., Abstracts with Programs, vol. 16, no. 1, p. 73, 1984.

The Goldenville – Halifax transition (GHT) of the Cambro-Ordovician Meguma Group is an important control for mineralization of tungsten, gold, zinc, lead and manganese. Locally, tin occurs as detrital grains in the clastic units of the GHT. Coticules (spessartine garnet quartzites), graphite layers, and carbonates coincide spatially with the highest concentrations of metals. The flyschoid Meguma Group represents an ample reservoir of metals that appear to have been concentrated in metamorphogenic veins. This study attempts to understand the relationship between manganiferous sediments, anoxic events in the Ordovician, and the enrichment of metals in particular strata. The path of manganese, gold, tungsten and base metals from sedimentation to greenschist facies and contact metamorphism will be investigated using geochemical and isotopic tools.

550. HENDERSON, J.R., Geol. Surv. Can.:
Meguma gold in the Ecum Secum-Liscomb area, Nova Scotia, 1982-.

See:

Analysis of structure as a factor controlling gold mineralization in Nova Scotia; Geol. Surv. Can., Paper 83-1B, p. 13-21, 1983.

Observations on the nature and origin of magnetic total field and vertical gradient anomalies over the Goldenville Formation in Nova Scotia; ibid., p. 57-65, 1983.

551. HOY, T., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Metallogenic maps of southeastern British Columbia, 1984-86.

The project involves production of metallogenic maps, accompanying comprehensive mineral deposit tables, and overview geological notes, of 1:1 000 000 scale map sheets in British Columbia. The Kootenay River sheet (82) in southeastern British Columbia, to be studied first, will be coordinated with the Geological Survey of Canada geological map sheet which is now in preparation.

552. KEAN, B.F., EVANS, D., Newfoundland Dept. Mines and Energy:
Geology and mineral deposits of Lushs Bight Group, Notre Dame Bay, Newfoundland, 1982-84.

Field work has been completed. Final report and maps in preparation.

553. KHEANG, L., CLARK, T., Québec Ministère Énergie et Ressources:
Évaluation du potentiel minéral des régions des lacs LaLande et Douay, Fosse du Labrador, Québec, 1984-85; thèse de maîtrise (Kheang).

Il s'agit d'évaluer le potentiel de gisements d'or et/ou de gisements type volcanogène dans des formations volcaniques de la Fosse du Labrador. Le travail se poursuit en 1984-85 afin d'étudier des secteurs plus en détails.

554. KIRKHAM, R.V., Geol. Surv. Can.:
Geology of copper and molybdenum deposits in Canada, 1970-.

555. KISH, L., VALADE, M., BOURQUE, Y., CIMON, J., Québec Ministère Énergie et Ressources:
Manganèse dans la fosse du Labrador, Québec, 1982-85.

À déterminer: l'effet du lessivage crétacé sur les roches protérozoiques; l'effet de la glaciation sur les aires lessivées au cours du crétacé; le cheminement et le lieu de redéposition des éléments remaniés, spécifiquement les concentrations secondaires de manganèse.

556. KLASSEN, R.A., Geol. Surv. Can.:
Uranium drift prospecting techniques; Lower Kazan River area, District of Keewatin, 1975-.

557. LACROIX, S., DARLING, R., École Polytechnique (Génie minéral):
Mineralogy and geology of the Ni-Cu deposits, Lac Aulneau, Québec, 1983-85.

558. LACROIX, S., DARLING, R., CIMON, J., CLARK, T., École Polytechnique (Génie minéral), Québec Ministère Énergie et Ressources:
Gîtologie des gîtes de Ni-Cu du Lac Aulneau, Fosse du Labrador, Québec, 1983-85; M.Sc. (Laroix).

Connaissance de la minéralogie des sulfures, leur altération, leur mise en place; étude des carottes de sondage; cartographie détaillée; échantillonnage; autres études gîtologiques.

559. LACROIX, R., PERRAULT, G., École Polytechnique (Génie minéral):
Gîtologie de la mine New Pascalis, Québec, 1983-85; M.Sc.A. (Lacroix).

Recherche des principaux paramètres structuraux, géochimiques et pétrologiques du gîte de la mine New Pascalis, Québec.

560. LYDON, J.W., Geol. Surv. Can.:
Geology of lead and zinc resources of Canada, 1977-.

See:

Some observations on the morphology and ore textures of volcanogenic sulphide deposits of Cyprus; Geol. Surv. Can., Paper 84-1A, p. 601-610, 1984

Some observations on the mineralogical and chemical zonation patterns of volcanogenic sulphide deposits of Cyprus; ibid., p. 611-616, 1984.

The geneation of ore-forming hydrothermal solutions in the Troodos ophiolite complex; some hydrodynamic and mineralogical considerations; ibid., p. 617-625, 1984.

561. MARMONT, S., COLVINE, A.C., Ontario Geol. Surv.:
Geological features of the Detour Lake Gold Mine, Ontario, 1984-86.

This is planned to encompass detailed mapping of the open pit, as well as accessible underground workings as they open up. In addition, regional mapping of the immediate area of the mine is considered necessary at the earlier stages of the program.

562. McMILLAN, W.J., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Highland Valley porphyry copper-molydbenum deposits, south-central British Columbia, 1969-85.

See:

Report on the East Pit of the Highmont operation; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 67-77, 1984.

Update on alteration and genesis of Highland Valley porphyry copper-molybdenum deposits; commence fluid inclusion study.

563. MORIN, G., GAUTHIER, M., Univ. Québec à Montréal (Sciences de la Terre):
Métallogénie de la région de Montauban, Maurice, Québec, 1982-84; thèse de maîtrise (Morin).

Voir:

Métallogenie de la région de Montauban; Québec Ministère Énergie et Ressources, DP 83-31, 1983.

Projet pratiquement termine. Le de brouillage de la géologie structurale et de la stratigraphie de la région de Montauban a permis d'établir une corrélation entre les différents gîtes de métaux usuels et pregeux qui s'y trouvent (y compris la mine d'or Muscocho). Ce travail a permis d'établir des criteres utiles pour l'exploration minére.

564. PANTELEYEV, A., SCHROETER, T.G., DIAKOW, L.J., Univ. Western Ontario (Geology):
Stratigraphy, structure, and petrology of the Toodoggone Volcanics and their relationship to the epithermal precious metal deposits, British Columbia, 1981-86; Ph.D. thesis (Diakow).

See:

Stratigraphic position of 'Toodoggone Volcanics'; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 136-138, 1984.

Geology between Toodoggone and Chukachida rivers; ibid., p. 139-145, 1984.

Field mapping at scale 1:50 000 is complete in the core of the 100 by 25 kilometre belt of 'Toodoggone volcanics.' Description of lithologic units, stratigraphy, geochronology, and chemical composition is continuing. More detailed studies of hydrothermal alteration and attendant zones of epithermal-type precious metal deposition are continuing. A geologic model for Jurassic volcanic-hosted epithermal precious metal deposits is being formulated for the Canadian Cordillera.

565. PEARSON, J., Saskatchewan Geol. Surv.:
Flin Flon gold studies, Saskatchewan, 1980-85.

See:

Gold metallogenic studies: Flin Flon-Amisk Lake area; Saskatchewan Geol. Surv., Misc. Rept. 83-4, p. 67-74, 1983.

Under this project the majority of known gold occurrences in the Flin Flon-Amisk Lake area have been examined through detailed geological mapping, mineralogical and geological studies. On this basis occurrences have been classified and genetic models developed.

566. PERRAULT, G., TRUDEL, P., BEDARD, P., École Polytechnique (Génie minéral):
Dispersion de l'or autour des gîtes de la mine Lamaque, Val d'Or, Québec, 1982-83.

Ce projet a débouché sur une autre étude: dispersion de l'or dans la région Lamaque-New Pascalis, Québec.

567. PLANTE, L., GAUTHIER, M., Univ. Québec a Montréal (Sciences de la Terre):
Minéralisations de cuivre-nickel-cobalt du Haut-Plateau de la Manicouagan, Côte-Nord, Québec, 1982-84; M.Sc. (Plante).

Voir:

Etude métallogenique du indices de cuivre-nickel-cobalt dans la region du Haut-Plateau de la Manicouagan; Québec Ministère Énergie et Ressources, 1984.

Projet quasi-termine. Localisation de minéralisation de cuivre-nickel-cobalt dans un complexe igné lité de composition variant d'ultramafique à mafique. Etablissement du style tectonique régional. Définition de critères unles pour la prospection des métaux susmentionnes et du chrome et du platine dans le complexe igné lite du Haut-Plateau de la Manicouagan.

568. RAVENHURST, C.D., ZENTILLI, M., REYNOLDS, P.H., Dalhousie Univ. (Geology):
The genetic relationship between carbonate-hosted Pb-Zn-Ba-F deposits and Carboniferous basins in Nova Scotia, 1983-86; Ph.D. thesis (Ravenhurst).

Mississippi Valley – type (MVT) Pb-Zn deposits show a strong spatial relationship to sedimentary basins and probably form as a normal consequence of the evolution of a sedimentary basin. The Carboniferous carbonate-hosted Pb-Zn-Ba-F deposits of Nova Scotia (i.e. Gays River) show many similarities to MVT deposits, but give fluid inclusion temperatures characteristic of Irish carbonate-hosted deposits. Genetic hypotheses ranging from early diagenetic, exhalative syngenetic, through epigenetic related to basinal brine expulsion, to epigenetic related to intrusions have been proposed in the literature for the Nova Scotia deposits. An assessment of the various genetic hypotheses, by restrictions on the relative and absolute timing of mineralization, and on the source of the metals and the fluids is being sought through isotopic and other methods, including fission track dating of suitable minerals. A fluid-flow model using a two-dimensional finite element method will be constructed.

569. ROSCOE, S.M., Geol. Surv. Can.:
Metallogeny of the northwestern part of the Canadian Shield, 1977-.

570. ROY, C., DARLING, R., LUDDEN, J.N., BÉLAND, J., École Polytechnique (Génie minéral):
Structure and geochemistry of the host rocks at Kiena Gold Mines, Quebec, 1980-83; M.Sc.A. (Roy).

571. RUZICKA, V., Geol. Surv. Can.:
Geology of uranium and thorium resources of Canada, 1975-.

See:

Uranium deposit research, 1983; Geol. Surv. Can., Paper 84-1A, p. 39-51, 1984.

572. SANGSTER, D.F., Geol. Surv. Can.:
Geology of lead and zinc deposits in Canada, 1965-.

See:

Petrology of early Cambrian and Devono-Carboniferous intrusions in the Loch Lamond complex, southeastern Cape Breton Island, Nova Scotia; Geol. Surv. Can., Paper 84-1A, p. 203-211, 1984.

Petrography of mineralization at the Yava sandstone-lead deposits, Nova Scotia; ibid., p. 345-352, 1984.

573. SAVOIE, A., PERRAULT, G., FILLION, G., École Polytechnique (Génie minéral):
Gîtologie de la mine Doyon, Québec, 1982-83; thèse de doctorat (Savoir):

Voir:

Distribution of gold in host rocks around the Doyon Mine No. 2 Orebody; CIM Bull. 77, Abstract, p. 92, 1984.

Recherche des principaux paramètres géochimiques, minéralogiques, pétrologiques et structuraux du gîte d'or de la mine Doyon.

574. SCHRIJVER, K., TASSÉ, N., HÉROUX, Y., ACHAB, A., DESJARDINS, M., INRS-Géoressources:
Métallogénie de la séquence carbonatée des basses-terres du Saint-Laurent: contribution à l'évaluation du potentiel minéral de la plate-forme Cambro-Ordovicienne, 1982-87.

575. SIMARD, M., GOSSELIN, C., Québec Ministère Énergie et Ressources:
Evaluation du potentiel minéral de la région de Carleton, Québec, 1982-84.

Etablir le potentiel économique de la région. Etablir la stratigraphie et la structure. Etude des aires d'altération hydrothermale reliées aux intrusions de composition mafique à acide.

576. SINCLAIR, W.D., Geol. Surv. Can.:
Geology of copper and molybdenum resources of Canada, 1977-.

577. THORPE, R.I., Geol. Surv. Can.:
Geology of silver and gold deposits in Canada, 1968-.

578. TROYER, D.R., GULIOV, P., Saskatchewan Geol. Surv.:
Saskatchewan peat resources study, 1982-84.

The peat resource study concentrated on the La Ronge-Montreal Lake area, Pinehouse area and the Buffalo Narrows – Beauval area. Field and laboratory data were compiled and resource estimates made. A final report is in the final stage of preparation and is expected to be completed by mid or late 1984.

579. VALIQUETTE, G., KELLY, D., BERNIER, L., Québec Ministère Energie et Ressources:
Evaluation du potentiel minéral – Région Lac Saint-Anne – Rivière Cascapédia et Lac Madeleine – Lac Adams, Québec, 1983-84.

Le principal objectif des travaux est de rechercher l'existence de métallotectes et, s'il y a lieu, définir l'environnement géologique et analyser le potentiel minéral du milieu. Les données minéralogiques, pétrographiques et géochimiques du laboratoire doivent préciser et compléter ces travaux qui devraient, si possible, s'intégrer dans un modèle métallogénique.

580. VU, L., DARLING, R., BÉLAND, J., École Polytechnique (Génie minéral):
Geology of the Ferderber ore zone, Belmoral Mine, Québec, 1983-85; M.Sc.A. (Vu).

581. WARES, R., WILLIAM-JONES, A., McGill Univ. (Geological Sciences), Québec Ministère Énergie et Ressources:
Synthèse métallogénique du gîte de Sullipek, 1983-85; thèse de doctorat (Wares).

Voir:

Synthèse métallogénique du gîte Sullipek et des environs; Québec Ministère Énergie et Ressources, DP 83-02, 1984.

Étude du gisement de Sullipek et mise au point de critères de terrain pour la prospection des gisements hydrothermaux de la Gaspésie.

PETROLEUM EXPLORATION/EVALUATION/ RECHERCHE ET ÉVALUATION DES GÎTES DE PÉTROLE

582. DEAN, M.E., LONGSTAFFE, F.J., HEIN, F.J., Univ. Alberta (Geology):
Regional diagenetic studies of the Lower Cretaceous Viking Formation, Alberta, 1983-85; M.Sc. thesis (Dean).

See:

Mineralogical controls on reservoir quality in the Harmattan oilfield, Lower Cretaceous Viking Formation, south-central Alberta; Geol. Assoc. Can., Program with Abstracts, vol. 9, p. 57, 1984.

To study the diagenesis of the Lower Cretaceous Viking Formation in south-central Alberta. Two main aspects will be studied: 1) to determine the regional sedimentological trends and the mineralogical variations due to depositional environment; and 2) to determine the paragenetic sequence of authigenic, pore-lining and pore-filling minerals and their relation to the diagenetic history of the area. From these studies the mineralogical control on reservoir quality will be determined.

583. DIETRICH, J.R., Geol. Surv. Can.:
Petroleum geology of Tertiary, Mesozoic and Paleozoic north of 68° on the NWT and Yukon mainland and offshore, 1975-.

584. FOSCOLOS, A.E., Geol. Surv. Can.:
Diagenesis of organic matter and clay minerals in sediments in relation to petroleum generation, 1975-.

585. FOSCOLOS, A.E., Geol. Surv. Can.:
Diagenetic profiles for reservoir exploration – frontier basin resources, 1983-.

586. GOODARZI, F., Geol. Surv. Can.:
Temperature history of Lower Paleozoic rocks, determined by optical study of dispersed organic materials, 1982-.

587. GRANT, A.C., Geol. Surv. Can.:
Geological interpretation of geophysical data as an aid to basin synthesis and hydrocarbon inventory, 1974-.

588. KALKREUTH, W.D., Geol. Surv. Can.:
The relationship between kerogen (type and rank) and chemical extract data, for the purpose of source rock evaluation, 1977-.

589. KIRK, J.S., LONGSTAFFE, F.J., BIRD, G., Univ. Alberta (Geology):
Simulations of the mineralogical changes of an oil sand caused by steam flooding, 1983-85; M.Sc. thesis (Kirk).

To simulate the mineralogical changes caused by steam-flood production of a mineralogically immature oil sand. The samples are characterized by petrography, X-ray diffraction, chemical analysis, and grain size analysis, both before and after a dynamic, flow-through simulation. The dynamic, flow-through simulation approximates the pressure, temperature and chemistry of a steam-flood injection. The resulting mineralogical and geochemical changes in the solid and liquid phases will be modeled.

590. KOVAC, L.J., LAST, W.M., Univ. Manitoba (Earth Sciences):
Geochemistry and sedimentology of Cretaceous oil shales in Manitoba, 1982-84; M.Sc. thesis (Kovac).

The organic-rich intervals are typically dark brown to black, weakly indurated marlstones and claystones. In hand sample the sediments are structureless to thinly bedded with discontinuous, parallel stratification and occasional pyrite-filled burrows and fractures. Thin lenses of siltstone and bentonite are found locally. Thin section examination reveals very fine primary lamination with abundant pyrite framboids. The sediment is moderately fossiliferous throughout and concentrations of foraminiferal and Inoceramus debris are common.

The sediments are composed mainly of calcite, quartz and clay minerals. The clays are dominantly expandable layer clays with secondary abundances of illite and various mixed layer clays. Lesser amounts of gypsum, dolomite, feldspar and pyrite are also present but together rarely make up more than 20% to the total mineral suite.

The oil shales average 6% TOC with the richest sections giving oil yields of about 60 l/t. The kerogen is immature to marginally mature as indicated by vitrinite reflectance (Ro=0.5) and peak yield temperatures (435°C). Detailed elemental analysis and visual assessment of isolated kerogen suggests Type II organic matter. However, Rock-Evalpyrolysis reveals considerable stratigraphic variation in the type of OM present with the sequence containing a large amount of very high hydrogen index material. This anomalously high HI is likely due to early generated bitumen in the shales.

591. LAST, W.M., Univ. Manitoba (Earth Sciences):
Petroleum source rock potential and geochemistry of the Mississippian Exshaw Formation, Western Canada, 1982-86.

The Exshaw Formation has the potential to be one of the best documented source rocks in the world. Organic type, maturity, and richness data are being acquired; work on the typing of specific accumulations and correlation to the extracts of the Exshaw is in progress.

592. LAST, W.M., McCULLOGH-SMITH, L.A., AHMED, M., HANSEN, B., Univ. Manitoba (Earth Sciences):
Sedimentology and diagenesis of selected petroleum reservoir rocks in Manitoba, 1983-86.

The sedimentology and diagenesis of important petroleum reservoir units are being investigated in southern Manitoba. At present, most emphasis is being placed on the: (a) Mississippian carbonate units, and (b) overlying Jurassic clastic/evaporite units.

593. MARTEL, A.T., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Prospective oil and gas areas of New Brunswick, 1983-86.

To make available to industry, government and public, a comprehensive report on the oil and gas potential of New Brunswick. The project involves four phases: 1) a compilation of existing geological data and literature pertinent to oil and gas in New Brunswick; 2) a study of New Brunwick formations to determine their potential as source rock or reservoir beds using existing information; 3) the collection of new data where information deemed vital for the proper evaluation of oil and gas potential in New Brunswick is lacking; and 4) the integration and interpretation of all the information resulting in a Dept. of Natural Resources Report.

594. McCULLOCH-SMITH, L.A., HALABURA, J., LAST, W.M., Univ. Manitoba (Earth Sciences):
The Woodnorth oil Field – A diagenetic trap Manitoba, 1983-84; M.Sc. thesis (McCulloch-Smith).

The Woodnorth oil field, located in southwest Manitoba, produces oil from carbonates of the Mississippian Lodgepole Formation. Core samples from the Woodnorth oil field were studied in detail by thin section petrogprahy and scanning electron microscopy. The stratigraphy, depositional history, diagenesis, and porosity were documented for the dolomite caprock, the unnamed Lodgepole member, the upper Daly member, and the middle Daly member. Reservoir quality of the Daly member was evaluated based on diagenetic changes and reservoir parameters.

The trapping mechanism in the Woodnorth area is structural in nature resulting from slump folding during solution of the Middle Devonian Prairie Evaporite Formation. The major effect of slump folding is the formation of vertical fractures in Woodnorth facies.

Woodnorth sediments accumulated on the slope of a broad northeastern shelf of the Williston basin. The energy level of the

environment varied from low energy, quiet water to high energy, agitated water conditions. The result is a cyclic sequence of interbedded sediments consisting of massive mudstone, laminated mudstone, micro-crystalline limestone, and crinoidal wackestone facies.

The principal diagnetic changes to affect Woodnorth sediments include dolomitization, cementation, silicification, recrystallization, and anhydritization. Based on textural relationships, the relative time of occurrence of each diagenetic process was determined.

Porosity is secondary in nature and the dominant pore types are solution-enhanced interparticle and intraparticle. Dolomitization and cementation are the major porosity-controlling processes.

The Woodnorth reservoir contains a highly undersaturated oil with a strong bottom water drive. Based soley on in situ matrix parameters, the Daly member provides only a low quality reservoir but extensive vertical fracturing allows the field to produce at economic rates.

595. McMILLAN, N.J., Geol. Surv. Can.:
Petroleum geology of Tertiary, Mesozoic and Paleozoic strata, north of 70°, District of Franklin, 1975-.

596. McMILLAN, N.J., Geol. Surv. Can.:
Petroleum evalution of mainland Territories, 1977-.

597. McMILLAN, N.J., Geol. Surv. Can.:
Petroleum resource evalution of western Canada, 1978-.

598. PROCTER, R.M., Geol. Surv. Can.:
Enchanced oil recovery research, 1982-.

599. QAYYUM, A.M., REEVES, M.J., Univ. Saskatchewan (Geological Sciences):
The influence of the mechanical properties of unconsolidated reservoir rocks on the production of heavy oil, 1984-86; M.Sc. thesis (Qayyum).

The relationships between the mechanical properties of fine sands and silts and their susceptibility to particle migration phenomena are under investigation. The project involves both laboratory experiments to determine the critical gradient for 'piping' and numerical simulations of reservoir flows.

600. RAICAR, M., Geol. Surv. Can.:
Microbial enhanced oil recovery in southwestern Ontario, 1983-.

601. SAWATZKY, H., POIRIER, M.A., STARR, J., JHA, K., THOMAS, K., EMR (CANMET), Alberta Research Council, Saskatchewan Dept. Energy and Mines, United States Dept. Energy:
The effect of recovery methods on the composition of recovered bitumen and heavy oils – Canada/US cooperative project, 1985-87.

To determine the changes that occur in the recovered bitumens and heavy oils during different in situ recovery methods. At this time both steam stimulation and combustion recovered materials will be investigated. This will involve a steam stimulated recovery in the United States tar sands and a fireflood recovery in Canada.

602. SKIBO, D.N., Geol. Surv. Can.:
Thermal history and basin evolution-Canadian frontier regions, 1983-.

603. TELFORD, P.G. JOHNSON, M.D., RUSSELL, D.J., Ontario Geol. Surv.:
Oil shale assessment project, a sub-part of the hydrocarbon energy resource program 1981-86.

The project continued with the drilling of 2 deep cores (St. Joseph Island and Manitoulin Island) and the continuation of study of the Collingwood shales (Lindsay Formation), Marcellus and Kettle Point Formations. Geochemical (Hydrocarbon) analyses are being made of selected intervals of core. The project is now at the analytical stage with reports coming out in 2 years.

604. WILLIAMS, G.L., Geol. Surv. Can.:
Maturation studies, 1981-.

605. YOLE, R.W., SYKORA, J., BROWN, D., Carleton Univ. (Geology):
Stratigraphic, petrographic and diagenetic studies of subsurface Mesozoic and Tertiary deltaic sequences, northern and eastern Canada, 1977-85; M.Sc. thesis (Sykora), B.Sc. thesis (Brown).

The petrography and diagenesis of Parsons Group sandstones (Cretaeous, Mackenzie-Beaufort area) are being investigated by J. Sykora. Petrography and depositonal environments of Cretaceous sands of the Hibernia field area are being studied by D. Brown. Combined with the earlier studies on Cretaceous sands of the Scotian Shelf (P. Yuan), refinement of sedimentation and diagenetic models of deltaic sequences will be attempted.

GENERAL/GÉNÉRALITÉS

606. BARRON, P.S., DILLON, E.P., SPRINGER, J.S., COLVINE, A.C., Ontario Geol. Surv.:
The geology of selected gold occurrenes in Eastern Ontario, 1983-84.

See:

Geology of selected gold occurrences in Eastern Ontario; Ontario Geol. Surv., Misc. Paper 116, 1984.

Gold-arsenopyrite-quartz veins localized at the basal unconformity of the Flinton meta-sedimentary group; ibid., 1984.

Six gold bearing areas in Anglesea, Abrrie, Kaladar and Clarendon township (southeastern Ontario, Grenville) were mapped at scales ranging from 1:1000 to 1:5000. Emphasis is in stratigraphic and structural associations of gold and base metal mineralization in the hope of developing a more regional classiciation of styles of mineralization. Epigenetic quartz and quartz-carbonate vein systems host gold within interflow metasediment in the Tudor mafic metavolcanics, within the overlying carbonate and clastic metasediments and a number of (gold) silver-base-metal-sulphosalt showings in the Flinton group of metasediments which unconformably overlie the metavolcanics and metasediments. Structure and metallogenesis together with the above mentioned stratigraphy provide a synthesis of gold mineralization styles in Anglesea, Barrie, Kladar and Clarendon township which will serve as an outline for programs in these areas.

607. BOISVERT, D., GAUTHIER, M., Univ. Québec a Montreal (Sciences de la Terre), Québec Ministère Énergie et Ressources:
Traitement informatique de données metallogeniques, 1983-85; thèse de maîtrise (Boisvert).

Mise sur pied d'un systeme de gestion de base de données comme support informatique de l'information geologique receuillie dans le cadre d'une campagne regionale d'exploration minerale. La banque de données ainsi constituée pourra acceuillir des informations geologiques receuillies sur les sites d'indices minéralisées, ou decoulant d'examens micros-copiques, de travaux de laboratoires et de recherches biblographique. Des traitements graphiques et statistiques sont aussi envisagés.

608. BROWN, A.C., École Polytechnique (Génie minéral):
Metallogenic studies of stratiform non-ferrous metal deposits, 1970-.

Determination of the genesis of stratiform ores, especially sediment-hosted base-metal mineralization, and definition of guide-lines for exploration for such deposits.

609. CHARTRAND, F., BROWN, A.C., École Polytechnique (Génie minéral):
Origin of stratiform copper mineralization in the Redstone "Copperbelt", N.W.T. and the Zairian "Copperbelt", central Africa, 1982-85; Ph.D. thesis (Chartrand).

Determination of the environment of stratiform copper mineralization at Redstone, and the timing of mineralization relative to syn-diagenesis of the host sediments.

610. CHATTERJEE, A.K., STRONG, D.F., MUECKE, G.K., Nova Scotia Dept. Energy and Mines:
Metallogenic assessment of Nova Scotian Devonian-Carboniferous granitoid rocks, 1982-.

See:

A multivariate approach to geochemical distinction between tin-specialized and uranium specialized granite of southern Nova Scotia; Can. J. Earth Sci., vol. 20, p. 420-430, 1983.

Mineralogical, petrological and geochemical study will continue to develop genetic and exploration models for the granophile deposits in Nova Scotia. Isotopic investigation is being undertaken to evaluate the role of fluids during magmatic, metasomatic and mineralization stages.

611. CHURCH, B.N., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geology of the Greenwood area, south-central British Columbia, 1981-.

See:

Geology and self potential survey of the Sylvester K gold-sulphide deposit; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, 1984.

Geoloyg and magnetometer survey of the Sappho gold-silver-platinum-copper prospect; ibid., Paper 1983-1, p. 27-31, 1983.

Geology mapping on a scale of 1:2400 and in more detail around existing and extinct mines to aid the understanding of ore controls and define exploration targets.

612. COGULU, E., Univ. Ottawa (Geology):
Geological and petrochemical study of the Great Lakes nickel deposit, 1983-86.

To study Ni-Cu-PGE and chromite mineralization and its stratigraphic control within a layered intrusion; to determine the relationship of this intrusion with other intrusions in the area; and to develop a model for the genesis of the ore minerals.

613. COLVINE, A.C., WOOD, J., Ontario Geol. Surv.:
Huronian metallogenetic development, northeastern Ontario, 1979-85.

614. DEAN, P.L., MEYER, J.R., Newfoundland Dept. Mines and Energy:
Mineral potential of clastic sedimentary basins in Newfoundland, 1981-84.

See:

Mineral potential of clastic sedimentary basins in Newfoundland; Newfoundland Dept. Mines and Energy, Min. Develop. Div., Rept. 84-1, 1984.

Field work in 1983 resulted in the discovery of base metal sulphides and fluorapatite in the Mid-Ordovician shales of central Newfoundland. Veins of Pb-Zn-W were discovered in the metasedimentary rocks of the Fleur de Lys Supergroup and chalcopyrite in amphibolitic rocks in the same sequence. These discoveries explain lake sediment geochemical anomalies in this area. Disseminated Pb-Zn-Cu sulphides in the Hadrynian sedimentary rocks of the Avalon Peninsula also explain the presence of lake sediment anomalies. Rock analyses from the 1982 field work show very high base metal values in the Carboniferous shales of the Bay St. George sub-basin.

615. DUNSMORE, H.E., Geol. Surv. Can.:
Metallogenic processes in sedimentary environments, 1982-.

616. FRANKLIN, J.M., Geol. Surv. Can.:
Metallogeny of the southwestern part of the Canadian shield, 1975-.

617. FRANKLIN, J.M., Geol. Surv. Can.:
Metallogeny of marine environments, including active spreading ridges, 1982-.

618. FUGLEM, M.O., Geol. Surv. Can.:
Evaluation of unconventional gas resources in the Deep Basin of western Canada, 1978-.

619. GOSSELIN, C., Québec Ministère Énergie et Ressources:
Evaluation du potentiel minéral des cantons de Power et de Joncas, 1983-84.

Evaluation du potentiel économique de la région. Etablir la stratigraphie et le contexte structural. Découverte d'aires d'altérations hydrothermales dans un contexte de failles de décrochement. Faibles valeurs en cuivre, or et molybdène.

620. GROSS, G.A., Geol. Surv. Can.:
Geology of mineral resources in the ocean, 1976-.

621. HAYNES, S.J., KEPPIE, J.D., O'BRIEN, B.H., SMITH, P.K., SOMMER, M., FARQUHAR, R.M., Nova Scotia Dept. Mines and Energy:
Megume gold project, Nova Scotia, 1982-84.

See:

Typomorphism of turbidite – hosted auriferous quartz veins, southern Guysborough County; Nova Scotia Dept. Mines and Energy, Report 83-1, p. 183-224, 1983.

622. HOGARTH, D.D., GIBBONS, W., Univ. Ottawa (Geology):
Geology of Martin Frobisher's "gold mines", Baffin Island, District of Franklin, 1983-85.

Rocks on Kedlunarn Island are NW-trending, SW-dipping, Precambrian quartzo-feldspathic biotite gneiss with interlayered hornblende-biotite gneiss. Rocks piles near the old Frobisher trenches are 1) hornblende-biotite rock, 2) hornblende-hypersthene rock, and 3) hornblende-spinel rock, all yielding low precious metal values. At least some of these rocks could have been transported from other localities during the early mining operations. Additional chemical analyses will be made and new sites will be sought out in order to piece together the story of Canada's first "gold mines" (worked 1577 and 1578).

623. LAVIGNE, M.J., COLVINE, A.C., MACDONALD, A.J., Ontario Geol. Surv.:
Beardmore-Geraldton mineral deposit studies, northwestern Ontario, 1983-85.

See:

Gold deposits of the Geraldton area; Ontario Geol. Surv., Misc. Paper 116, 1984.

624. MACDONALD, A.J., Ontario Geol. Surv.:
Gold in iron formation, Ontario, 1982-84.

See:

The iron formation gold association evidence from Geraldton area; Ontario Geol. Surv., Misc. Paper 110, p. 75-83, 1983.

The project will be complete during 1984 by fill-in mapping in the Geraldton area (1 month) and several weeks petrography to outline (a) metamorphic facies, hydrothermal alteration, (b) fluid inclusion characteristics; subsequent analysis of rocks and veins will fully characterise the distribution of gold and assocaited elements throughout the mineralized area; microthermometric analysis of fluid inclusions will aid documentation of the thermal regime, the length of mineralization and the fluid compositions.

625. MACDONALD, A.J., Ontario Geol. Surv.:
Geology of gold, 1982-85.

See:

A re-appraisal of the Geraldton gold camp; Ontario Geol. Surv., Misc. Paper 116, p. 194-197, 1983.

626. MCDONALD, B., GODWIN, C.I., Univ. British Columbia (Geological Sciences):
Geothermometry and alteration zoning studies of the Mt. Skukum epithermal Au-Ag deposit, 1984-86; M.Sc. thesis (McDonald).

Using GEOLOG System as the basis of examining a large body of empirically observed core observation, the study will describe zoning of alteration in this recently found, northerly, epithermal gold deposit.

Fluid inclusion studies will be used to define geothermometry of the deposit. Thin section, XRF and XRD analyses will be used to study zoning. Isotope studies are not contemplated at this time.

627. MILLER, A.R., Geol. Surv. Can.:
Metallogeny of the Baker Lake-Thelon region, Northwest Territories, 1981-.

628. MOHAN, K.V., HALE, W.E., MCALLISTER, A.L., BACHINSKI, D.J., Univ. New Brunswick (Geology):
Geology, petrochemistry and tectonic setting of the Rambler area, Baie Verte, Newfoundland, 1984; M.Sc. thesis (Mohan).

629. MOSSMAN, D.J., DOGGETT, M.D., MACDOUGALL, D., Mount Allison Univ. (Geology):
The case for small scale mining of Nova Scotian gold. Some case histories and geological details, 1982-84.

630. RUITENBERG, A.A., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Gold deposits Bay of Fundy coastal zone, 1983-86.

See:

Metallic mineral zonation related to tectonic evolution of the New Brunswick Appalachians; in Regional trends in the geology of the Appalachian-Caledonian-Hercynian Mauritanide Orogen, p. 363-373, 1983.

Gold-bearing quartz ± carbonate veins and stockworks occur in the Cape Spencer and Musquash Harbour area, respectively, east and west of Saint John. In the Cape Spencer and Beveridge Cove areas, the hostrocks are hydrothermally altered equivalents of uppermost Precambrian or lowermost Cambrian, purplish grey slate, siltstone, and sandstone that are intruded by fine-grained, very siliceous granite. The fine-grained sedimentary rocks have a well-developed penetrative cleavage (S_1) mostly subparallel, but locally at a high angle to bedding. In places, a second cleavage (S_2) and a third cleavage (S_3) can be recognized. S_3 is related to thrust faults and S_3 to younger steeply diping faults.

The oldest gold-bearing quartz impregnations are gently plunging, crudely lens-shaped bodies that occur where overturned F_2 folds and the associated S_2 cleavage are prominently developed. The thickest part of the mineralized lenses commonly occurs in the axial region of F_2 folds. Hematite-rich quartz veins and stockworks cut across and are usually richer in gold than the lens-shaped quartz impregnations. Thin gold-bearing quartz-carbonate veins are the youngest mineralized structures at Cape Spencer.

In the Musquash Harbour area, gold-lead-zinc-copper-bearing quartz veins and stockworks occur within or along the contacts of Carboniferous or older, intensely fractured, very siliceous granitic intrusions that cut across Precambrian or younger granodiorite. Along Little Dipper Harbour, farther to the southwest, gold-lead-zinc-copper-bearing quartz veins cut across Carboniferous or older sandstones and conglomerates. The veins occur along the southern limb of an overturned anticline.

631. SAGE, R.P., TROWELL, N.F., Ontario Geol. Surv.:
Alkalic rocks and carbonatites of northwestern Ontario, 1975-.

632. SANGSTER, D.F., Geol. Surv. Can.:
A study of certain accessory elements in Canadian sulphide assemblages and minerals, 1973-.

633. SKETCHLY, D., SINCLAIR, A.J., Univ. British Columbia (Geological Sciences):
Hydrothermal alteration at the Erickson gold mine, Cassiar District, British Columbia, 1983-84; M.Sc. thesis (Sketchly).

See:

Preliminary report on wallrock alteration, Erickson gold mine, Cassiar District; British Columbia Ministry Energy, Mines, Petrol. Res., Report 1984-1, p. 260-262, 1984.

Aims are: 1) to document and describe hydrothermal alteration in the Erickson gold camp; 2) to distinguish regional hydrothermal alteration from that related to gold-quartz veins; and 3) to develop a practical lithogeochemical approach to distinguishing alteration types as an aid to exploration in the Cassiar area.

634. SOUTHER, J.G., Geol. Surv. Can.:
Geothermal energy resources in Canada, 1973-.

See:

Geothermal measurements in northern British Columbia and southern Yukon Territory; Can. J. Earth Sci., vol. 21, no. 5, p. 599-608, 1984.

635. TUACH, J., DEAN, P.L., POOLE, W.H., STRONG, D.F., DAVENPORT, P.H., DICKSON, W.L., Memorial Univ. (Earth Sciences), Geol. Surv. Can.:
Metallogeny of granitoid rocks (Ackley Granite) and Cross Hills Plutonic Suite in the Fortune Bay area, Newfoundland, 1983-85; Ph.D. thesis (Tuach).

636. WATKINSON, D.H., GIBSON, H.L., TALKINGTON, R., Carleton Univ. (Geology):
Genesis of metallic mineral deposits, 1978-88; PH.D. thesis (Gibson).

Ultramafic-mafic rocks and Ni-Cu-PGE-Cr: Results of research on genesis of metallic concentrations indicate that magmatic processes are necessary, but not sufficient, to produce most deposits of chromite, platinum-group minerals (PGM) and nickel-copper. Cu-Zn mineralization and alteration of volcanic rocks: The study of alteration assemblages around Cu-Zn deposits in volcanic rocks (and their metamorphosed equivalents) has produced very significant results, especially concerning early silicification in the vicinity of many Noranda deposits. This type of alteration is more extensive and somewhat stratabound compared to the commonly described, crosscutting, "pipe" alteration (chloritization, sericitization). As a result, exploration targets may be broadened if this type of alteration is recognized in other areas.

637. ADSHEAD, J.D., Geol. Surv. Can.:
Mineralogy and geochemistry of the unconsolidated cover – Central Arctic, 1976-.

638. CABRI, L.J., LAFLAMME, J.H.G., EMR (CANMET):
In-situ analysis by micro-PIXE and mineralogy of platinum-group elements, 1971-85.

See:

Quantitative proton microprobe analyses of major sulphides in ore deposits of the Sudbury area; Geol. Assoc. Can. – MAC Annual meeting, Program with Abstracts, vol. 8, p. A9, 1983.

Quantiative micro-PIXE in sulphide mineralogy; 3rd Internat. Conf. on Particle-Induced X-ray Emission (PIXE) and Its Analytical Applications, Program with abstracts, D9, 1983.

Trace silver anlayses by proton microprobe in ore evaluation; in Precious Metals: Mining, Extraction and Processing, Metallurgical Soc. AIME, p. 93-100, 1984.

The accurate metal balances required for the development of efficient recovery schemes require the measurement of very small quantities of precious metals and other significant elements in the major minerals of ore deposits. Good progress has been made in research on the use of micro-PIXE and secondary ion mass spectroscopy (SIMS).

639. CABRI, L.J., LAFLAMME J.H.G., EMR (CANMET):
Mineralogical characterization of inorganic constituents of Canadian coals, 1977-86.

640. CERNY, P., Univ. Manitoba (Earth Sciences):
Mineralogy and petrology of pegmatities, 1971-.

See:

Crystal chemistry and stability of petalite; Tscherm. Miner. Petr. Mitt., vol. 31, p. 81-96, 1983.

Geochemistry and petrology of feldspar crystallization in a simple pegmatite was interpreted on the basis of electron and ion probe analysis for 18 elements of 75 feldspars. Structural and compositional fractures of 20 adularias from pegmatites were interpreted in terms of parent environment and crystallization mechanism; properties of the most disordered high sanidine known so far were reported. Crystal chemistry and stability of petalite were provided on the basis of new compositional and experimental data. A study of the Rb-richest natural K-feldspar was started to characterize its composition and physical properties (up to 5.8 wt.% Rb_2O in the microcline phase of a perthite).

641. CERNY, P., ERCIT, T.S., HAWTHORNE, F.C., WISE, M.A., Univ. Manitoba (Earth Sciences):
Crystal chemistry and geochemistry of Nb, Ta oxide minerals in granitic pegmatites, 1983-87.

A systematic crystal-chemical review was initiated of the Nb, Ta (Sn, Ti, Te, Mn...) bearing species occurring in granitic pegmatities, to establish their compositional and structural ranges in general, their fractionation trend in different pegmatite types, and element partitioning in co-existing minerals.

642. CHACKOWSKY, L.E., FERGUSON, R.B., MACEK, J., Univ. Manitoba (Earth Sciences), Manitoba Dept. Energy and Mines (Geol. Services Br.):
Universal stage, X-ray diffraction and electron microprobe characterization of a plagioclase feldspar from Iceland, 1983-84.

Six zones in a single crystal of a plagioclase from a Pleistocene andesite near Akureyri, Iceland have been investigated as a test case for the derivation of composition and structural state by means of the optical U-stage using the modification by Macek (1979, Ph.D. Thesis, University of Manitoba) of the classical Fedorov method for albite-twinned plagioclase. Macek's modified method gives compositons of the zones that range from An_{38} to An_{59}, and a structural state slightly below high -T for the whole crystal. Electron microprobe analysis of eight points of a different zoned crystal gave compositions ranging from An_{39} to An_{53}, and these compositions combined with refined unit cell parameters from Gandolfi photos again indicate a structural state slightly below high -T. The nature of the optical results is such as to confirm for the first time the correctness of some of Macek's theoretically derived determination curves over the composition range examined.

The results of this study suggest that Macek's U-stage method can be used with confidence to optically derive the composition and structural state of a plagioclase.

643. CHAGNON, A., DESJARDINS, M., KUBLER, B., INRS-Géoressources, Univ. Neuchatel (Suisse):
Géologie des argiles des unités Cambro-Ordoviciennes des Basses-Terres du Saint-Laurent, Québec, 1983-85; thèse de doctorat (Chagnon).

L'étude des assemblages de minéraux des argiles et des propriétés cristallochimiques de ceux-ci vise: 1) la détermination de l'évolution diagénétique des sédiments, 2) une meilleure compréhension des environnements de dépôt, 3) l'établissement de minéraux stratigraphiques repère, 4) la prospection de zones ayant été affectées par des phénomènes d'altération tardifs, hydrothermaux ou autres.

644. CHAGNON, A., GOSSELIN, C., INRS-Géoressources, Québec Ministère Énergie et Ressources:
Géologie des argiles des groupes de Matapédia et d'Honorat de la région de Carleton, Québec, 1982-83.

Il a été déterminé que la maturation thermique de la séquence sédimentaire sous études était reliée à l'enfouissement. Des phénomènes tardifs, tectoniques et hydrothermaux ont tronqué ou déformé certaines zones de maturation définies par les minéraux d'argiles. Les aires d'altération montrent des assemblages différents de minéraux d'argiles et il reste à définir le rapport entre ces assemblages et certaines minéralisations observées.

645. CHAGNON, A., MORIN, R., INRS-Géoressources, Québec Ministère Énergie et Ressources:
Minéralogie des argiles des aires d'altération dans les Formations de Pabos et de White Head et du Groupe de Fortin de la région de Restigouche, Québec, 1983-84.

Définir et délimiter des zones d'altération hydrothermale à partir des assemblages des minéraux des argiles. Vérifier s'il y a une relation entre les assemblages et les indices minéralisés.

646. CHAGNON, A., SASSANO, G.P., SCHRIJVER, K., INRS-Géoressources, Univ. Concordia (Géologie), Québec Ministère Énergie et Ressources:
Minéralogie des phyllosilicates des zones d'altération reliées aux dépôts cuivreux de la région d'Acton Vale, 1982-84.

Des assemblages minéralogiques ont été définis dans la région d'Acton Vale. Quelques-uns de ceux-ci auraient une origine hydrothermale et se retrouvent associés à des dépôts cuivreux ayant déjà été exploités. Il reste à définir les relations spatiales, temporelles et chimiques entre ces deux phénomènes.

647. CHEN, T.T., EMR (CANMET):
Mineralogy of mercury in Canadian sulphide ores, 1979-86.

648. CHEN, T.T., EMR (CANMET):
Low-grade coal in utility boilers, 1982-85.

The study of the phase characteristics and textures of slags helps to understand the mechanism of fouling and slagging of utility boilers. This is an essential component of the effective utilization of low-grade coals.

649. DESJARDINS, M., CHAGNON, A., INRS-Géoressources:
Composition chimique des argiles et diagenèse.

650. EGAN, D.M., LAST, W.M., Univ. Manitoba (Earth Sciences):
Mineralogical aspects of hypersaline lakes in southern Saskatchewan, 1981-84; M.Sc. thesis (Egan).

651. ERCIT, T.S., CERNY, P., HAWTHORNE, F.C., Univ. Manitoba (Earth Sciences):
Crystal chemistry and paragenesis of simpsonite and associated minerals, 1980-85; Ph.D. thesis (Ercit).

See:

Crystal chemistry and paragenesis of Nb, Ta-minerals associated with simpsonite; Univ. Manitoba Centre for Precambrian Studies, Ann. Rept. 1982, p. 112, 113, 1983.

Research into the crystal chemistry and paragenesis of simpsonite is continuing; survey of the crystal chemistry of wodginite led to the discovery of three new minerals species, and nomenclature adjustments were also found necessary in the microlite group; crystal structure and formula of alumotantite were established, and the crystal structure plus chemistry of natrotantite resolved.

652. FERGUSON, R.B., BALL, N.A., Univ. Manitoba (Earth Sciences):
Quantitative mineralogical analysis of microcline and albite in perthites by X-ray powder diffractometry, 1983-84.

Mixtures of known amounts of low albite with maximum microcline have been X-rayed on a Philips PW1710 Automated X-ray Powder Diffractometer to provide precise values of the relative intensities of the albite-microcline pairs of the $\bar{2}01$ reflections and the strongest reflections, the latter consisting of $\bar{2}02$, 002, 040, 220 of low albite, and $\bar{2}20$, 002, 040 of maximum microcline. The results are in the form of a linear regression line for the ratios of peak heights versus weight per cent albite in the mixture which can be used to determine precisely the proportions of the two phases in low-albite-maximum microcline perthites.

653. FERREIRA, R.J., CERNY, P., Univ. Manitoba (Earth Sciences):
The Lower Tanco pegmatite, southeastern Manitoba, 1981-84; M.Sc. thesis (Ferreira).

See:

The Lower Tanco pegmatite at Bernic Lake southeastern Manitoba; Univ. Manitoba Centre for Precambrian Studies, Ann. Rept. 1982, p. 108-110, 1983.

Geochemical and mineralogical characterization of the Lower Tanco pegmatite revealed its enrichment in Li, Rb, and Cs at the level of the Tanco deposit, but a lower degree of Fe/Mn, Nb/Ta fractionation and a conspicuous depletion of P and F. The assemblage of Nb, Ta and Sn minerals is simple and much different from that in the Tanco deposit.

654. GAIT, R.I., Royal Ontario (Mineralogy and Geology):
Crystal morphology of pyrite and the associated minerals from Nanisivik mine, Baffin Island. Pyrite morphology in general, 1983-.

The unusual crystal morphology of pyrite from Nanisivik is being studied together with some of the associated minerals such as arsenopyrite, dolomite, calcite, sphalerite. Some of the pyrite crystals exhibit peculiar circular features on the crystal faces. Continuing interest in pyrite morphology.

655. GAIT, R.I., Royal Ontario Mus. (Mineralogy and Geology):
Study of asteriated quartz from Sri Lanka, 1983-.

Includes an examination of a pale milky grey asteriated quartz from Sri Lanka showing a remarkably pronounced asterism. The project is to describe the complex asterism (a high cabochon exhibits at least seven 6-rayed stars and six 4-rayed stars) and discover its cause.

656. GIOVENAZZO, D., PERRAULT, G., École Polytechnique (Génie minéral):
Minéralogie de l'or en Abitibi, Québec, 1980-84; M.Sc.A. (Giovenazzo).

Recherche de la nature de l'or dans les gîtes aurifères de l'Abitibi. Ce projet est avancé et devrait bientôt donner lieu à une publication. L'or natif des gîtes de l'Abitibi contient tantôt 95% Au et 5% Ag, tantôt 80% Au et 20% Ag. Les tellurures minéraux sont occasionnels.

657. GRANT, S.K., LONGSTAFFE, F.J., HEIN, F.J., Univ. Alberta (Geology):
Sedimentation and clay mineralogy of the Cretaceous Harmattan Oil Field, Alberta, 1983-84; M.Sc. thesis (Grant).

To define the sedimentologic and mineralogic characteristics of the Harmattan oil field, south central Alberta. Information collected will be used in future exploration for similar types of reservoirs. Detailed clay mineralogy, in conjunction with sedimentary modeling will be used in developing the most efficient secondary recovery program for this field.

658. HARRIS, D.C., Geol. Surv. Can.:
X-ray diffraction analyses and mine alogical studies, 1968-.

See:

Trace silver analyses by proton microprobe in ore evaluation; Precious Metals: mining, extraction and processing, Conf. Proc. AIME, Feb. 1984, p. 93-100, 1984.

Uranium deposit research, 1983; Geol. Surv. Can., Paper 84-1A, p. 39-51, 1984.

Tintinaite et sulfosels associés de Tintina (Yukon): la cristallochimie de la série de la kobellite; Can. Mineral., vol. 22, pt. 2, p. 219-226, 1984.

Kiddcreekite, a new mineral species from the Kidd Creek mine, Timmins, Ontario and from the Campbell orebody, Bisbec, Arizona; ibid., p. 227-232, 1984.

Mineralogical studies of the ore minerals in the Izok Lake massive sulphide deposit located on the northern part of the Slave structural province in the District of Mackenzie, Northwest Territoris, have been completed, and a detailed report submitted to Kidd Creek Mines Limited.

Mineralogical studies are progressing on the Hemlo gold deposits, Marathon area, Ontario. Detailed examination of the ore minerals in 14 drill holes from properties of Canada and Teck Corona International have been completed. The results show that the mineralization is more diversified than in most gold deposits in the world, and unusual in that they are enriched in barium, molybdenum, vanadium and, localy in mercury and thallium. The enrichment in arsenic and antimony, however, is comparable to many of the major gold deposits of the Canadian Shield of Archean age.

659. HOEVE, J., Saskatchewan Research Council (Geology):
Clay mineral diagenesis, host rock alteration and mineralization in the Athabasca Basin, northern Saskatchewan.

See:

Clay mineral stratigraphy of the Athabasca Group: correlation inside and outside the Carswell structure; Saskatchewan Research Council, Publ. G745-4-A-83.

To study relationships between basin evolution, burial diagenesis, host rock alteration and uranium mineralization. Work to date has demonstrated a direct correlation between host rock alteration features and prograde and retrograde diagenesis. Illite host rock alteration, associated with primary mineralization at about 1300 Ma, is tied to prograde diagensis and deep burial. Kaolinite alteration, correlated with remobilization of uranium at 250-300 Ma is linked to retrograde diagenesis accompanying uplift and unroofing of the Athabasca Basin.

660. JAMBOR, J.L., EMR (CANMET):
Mineralogical studies of base-metal ores in the Atlantic Provinces, 1977-85.

See:

Mineralogy of the Tulks Zn-Pb-Cu massive sulphide deposit, Buchans area, Newfoundland; CANMET, Div. Rept. 84-22, 1984.

Detailed mineralogical studies of undeveloped ores provide the basis for the development of economical schemes for extraction and processing.

661. JAMBOR, J.L., EMR (CANMET):
Mineralogy of intermediate members of the plumbojarosite-beaverite series, 1981-85.

See:

Man's first use of jarosite: The pre-Roman mining-metallurgical operations at Rio Tinto, Spain; CIM Bull., vol. 76, no. 800, p. 78-82, 1983.

662. JAMBOR, J.L., EMR (CANMET):
Mineralogy and alteration around the Lucky Strike orebody, Buchans, Newfoundland, 1982-84.

Results so far indicate that extensive changes will be made in the interpretation of geological relations.

663. LEE, D.N.H., LONGSTAFFE, F.J., Univ. Alberta (Geology):
Clay mineralogy, stable isotope geochemistry and diagenesis of clastic rocks, Bird Fiord and Weatherall formations, Bathurst and Melville Islands, Arctic Archipelago, 1984-85; M.Sc. thesis (Lee).

To reconstruct the diagenetic history of the Bird Fiord and Weatherall formations. Certain types of clay minerals (authigenic clays) can form during the diagenetic processes. The mineralogy and oxygen isotope chemistry of such phases reflect the temperatures and fluids involved in their formations. The source and time of emplacement of the authigenic clays, and the nature of the ancient pore fluids responsible for their creation, have important consequences for the hydrocarbon potential of these units.

Clay minerals deposited during sedimentation (detrital clays) provide information on sediment source and its environment of deposition. These data can be integrated with stratigraphic, sedimentologial and paleontological information to produce a geological synthesis of the area.

664. LONGSTAFFE, F.J., MONTGOMERY, D.S., Univ. Alberta (Geology):
Clay mineralogy of oil sands, Alberta, 1982-.

See:

Separation and characterization of clay from Athabasca asphaltene; Fuel, vol. 62, p. 353-362, 1983.

The clay, which during extraction of the Athabasca oil sand with benzene passes through the Soxhlet extraction thimble together with bitumen, has been identified by X-ray diffraction as a mixture of kaolin minerals and illite interstratified with less than 10% smectite and some quartz in trace amounts. No evidence was found for the presence of discrete swelling clay minerals. With decreasing crystallinity and particle size, the clay has an increasing affinity towards organic matter. Altogether, this makes the removal of clay from asphaltene progressively more difficult.

665. MAINWARING, P.R., EMR (CANMET):
Mineralogical study of base metal deposits in the northern Cordillera, 1982-85.

See:

Initial mineralogical characterization of the Windy Craggy Cu-Co deposit, British Columbia; CANMET, Div. Rept. MRP/MSL 83-107 (IR), 1983.

Detailed mineralogical studies of undeveloped deposits provide rational bases for the development of economical schemes for extraction and processing.

666. MCCANN, J., PERRAULT, G., École Polytechnique (Génie minéral):
Géochimie et minéralogie de la minéralisation U-Nb-Terres Rares du Lac Walker, Québec, 1978-84; M.Sc.A. (McCann).

Au-delà de la chevkinite et de la fergusonite, nous avons identifié de la gadolinite, du pyrochlore, de l'allanite et plusieurs autres espèces rares. Ces minéralisations appartiennent à la phase mobilisante de l'ensemble magmatique.

667. MCGREGOR, C.R., FERGUSON, R.B., Univ. Manitoba (Earth Sciences):
Characterization of granitic and pegmatitic K-feldspars from Lac du Bonnet, Manitoba and Dryden, northwestern Ontario by rapid X-ray diffraction and chemical methods, 1980-84; M.Sc. thesis (McGregor).

668. MOSSMAN, D.J., PRINGLE, G., Mount Allison Univ. (Geology), EMR (CANMET):
Mineralogy and chemistry of davidite – Canadian occurrences, 1979-84.

669. NELSON, E.B., LONGSTAFFE, F.J., Univ. Alberta (Geology):
Diagenesis of Tertiary clastic sedimentary rocks, Vancouver and Queen Charlotte Islands, Canada, 1983-85; M.Sc. thesis (Nelson).

Clastic sedimentary rocks of Tertiary age are exposed along the south and west coasts of Vancouver Island. These rocks will be examined to assess the influence of the original sedimentary environments, initial mineralogies, water/rock interactions and tectonic activity (faulting) on diagenesis.

Recent surficial sediments from offshore Vancouver Island and Queen Charlotte Islands have been deposited in environments similar to those proposed for the Tertiary rock sequences. Examination of this sediment may provide a basis for comparision with the detrital grain mineralogy of the rocks.

Identification of authigenic and alteration mineral assemblages will aid in determining the nature of diagenesis.

670. OTTAWAY, T., WICKS, F.J., Univ. Toronto (Geology), Royal Ontario Mus. (Mineralogy and Geology):
Mineralogy and geochemistry of Colombian emerald deposits, 1981-85; M.Sc. thesis (Ottaway).

Detailed petrographic and mineralogical studies of the host rocks and the emerald and non-emerald bearing veins are in progress.

This will provide the bases for interpretation of geochemial and fluid inclusion data. The study is focusing on the Muzo deposit because the sample selection was carried out with good geologial control. The Chivor deposit is not as well understood but it has slightly different host rocks and emerald-vein mineralogy and will provide a check on the findings and interpretation of the Muzo results.

671. PERRAULT, G., BEAUDOIN, A., École Polytechnique (Génie minéral):
Morphologie de la sérandite du Mont St-Hilaire, Québec, 1983-84.

L'objectif est d'inventorier toutes les formes cristallines pour la sérandite du Mont St-Hilaire, Québec. Faible progrès seulement en 1983-84.

672. PETERSON, R.C., JAMEISON, H., Queen's Univ. (Geological Sciences):
Inverse/normal character of magnesioferrites as a function of composition and thermal history, 1983-84.

673. PETRUK, W., EMR (CANMET):
Mineralogy applied to mineral processing and extractive metallurgy, 1975-86.

See:

The behaviour of minerals during flotation of a base-metal ore from Brunswick No. 12 deposit in Canada; Proc. First Internat. Cong. on Applied Mineralogy, Geol. Soc. South Africa, Spec. Publ. 7, p. 201-208, 1983.

Reactions of sinter in a lead blast furnace; Metall. Trans., vol. 14B, no. 4, p. 617-623, 1983.

Image analysis, used as a mineralogical research tool in developing methods of process improvement in the Bathurst area of New Brunswick, has matured and become more generalized in application. It is applied to other metallurgical process and is being automated with scanning electron microscopy as the image forming component.

674. PLANT, A.G., Geol. Surv. Can.:
Electron beam microanalysis, 1962-.

675. ROBB, G.A., LONGSTAFFE, F.J., HEIN, F.J., Univ. Alberta (Geology):
The Viking sandstone project: Garrington Oil Field, central Alberta, 1983-84; M.Sc. thesis (Robb).

To describe and interpret the stratigraphy and mineralogy of the Viking Formation in the Garrington Oil Field of south-central Alberta. Stratigraphic studies are being used to develop a sedimentological model for the emplacement of these rocks. Mineralogical analysis is being used to study and interpret the diagenesis of these rocks.

To achieve these goals 67 cores of the Viking Formation in the Garrington Oil Field have been logged and correlated. This information has been used to produce isopach maps and fence diagrams. Samples taken from core have been analyzed using hydrometer, X-ray diffraction (XRD), thin section and scanning electron microscopy (SEM).

676. SPRINGER, J.S., Ontario Geol. Surv.:
Active carbon in Ontario gold deposits, 1982-.

See:

Invisible gold; Ontario Geol. Surv., Misc. Paper 110, p. 240-250., 1983.

The distribution of active carbon in Archean gold deposits will be examined, together with a mechanism of deposition. The source of the carbon and its origin will be investigated.

677. SZYMANSKI, J.T., EMR (CANMET):
Crystal structure analysis of minerals to aid research in mineral processing and metallurgy, 1982-86.

The study of mannardite provides essential data on a minor constituent of a large undeveloped base metal deposit in northern British Columbia. As a hollandite-type mineral it may be significant in the development of "synrock" for nuclear waste disposal.

678. TURNOCK, A.C., RAUDSEPP, M., Univ. Manitoba (Earth Sciences):
Crystal chemistry and structure of synthetic amphiboles, 1980-84; Ph.D. thesis (Raudsepp).

About 200 synthetic mixtures with variable contents of Cd (for B site), Sc, V, Cr, Cu, Ni, Co, Ga, In (for C site), Ge (for T site) were treated (P,T) to make amphiboles, of four of the major amphibole groups. The products were characterized by optical and scanning-electron microscopy (morphology, detection of foreign phases), X-ray diffraction (cell dimensions, foreign phases), Rietveld structure analysis (ordering and site occupancies), infra-red spectroscopy (ordering), and Magic-angle spinning nuclear magnetic resonance spectroscopy (ordering). These results, together with a review of all monoclinic amphibole syntheses, were used to evaluate the problems of amphibole synthesis.

679. WICKS, F.J., Royal Ontario Mus. (Mineralogy and Geology), Univ. Toronto (Geology):
The structures and crystal chemistry of the serpentine minerals, 1970-.

See:

Deformation histories as recorded by serpentinites. I. Deformation prior to serpentinization. II. Deformation during and after serpentinization. III. Fracture patterns developed prior to supertinization; Can. Mineral., vol. 23, pt. 1, p. 185-209, 1984.

The problems of locating good single crystals of the various serpentine minerals has lead to investigating the application of X-ray powder diffraction structure refinements to the serpentine structures.

680. WICKS, F.J., RAMIK, R., Royal Ontario Mus. (Mineralogy and Geology), Univ. Toronto (Geology):
Thermal and evolved gas analyses of minerals, 1976-.

See:

Weddellite from Biggs, Oregon, U.S.A.; Can. Mineral., vol. 21, pt. 3, p. 503-508, 1983.

Granophyllite from Franklin, New Jersey; Pajsberg, Sweden; and Wales: New chemical data; Mineral. Mag., vol. 47, p. 563-566, 1983.

The thermal analysis laboratory at the R.O.M. employs a Mettler TA1 vacuum Thermoanalyzer to obtain simultaneous DTA-TG-DTG. The instrument is designed to run samples in various atmospheres (N_2, CO_2, O_2, H_2O), or under vacuum. Recent modificiations carried out at our laboratory have increased the high vacuum capability to 10^{-9} torr, and made possible the installation of a quadrupole mass spectrometer (Inficon IQ200), for continuous analysis of evolved gases. The identification and measurement of partial pressures of evolved gases aids the user in recognizing the initiation of reactions and unravelling complex overlapping reactions.

The system has been used primarily for TG determination of H_2O and CO_2 in minerals. In this regard, much of the work has dealt with phosphate, arsenate, carbonate and silicate species. The system has also found use in the production of DTA curves, phase transition studies, oxidation and reduction anayses, fluid inclusion studies and rock analyses for volatiles.

681. WISE, M.A., CERNY, P., Univ. Manitoba (Earth Sciences):
Mineralogy and geochemistry of the oxide minerals of Nb, Ta, Sn and Ti from the Yellowknife pegmatite field, Northwest Territories, 1981-84; M.Sc. thesis (Wise).

See:

Geochemistry and crystal chemistry of Nb-Ta oxide minerals and associated phases in the Yellowknife pegmatite field, N.W.T.; Univ. Manitoba Centre for Precambrian Studies, Ann. Rept. 1982, p. 97-99, 1983.

Distribution and structural setting of fertile granites and related pegmatites in the Yellowknife pegmatite field, District of Madunzia; Geol. Surv. Can., Paper 84-1A, p. 373-381, 1984.

Mineralogy and geochemistry of Nb, Ta, Sn and Ti is examined in the pegmatities of the Yellowknife field, in correlation with overall mineralogy and geochemistry of individual parent pegmatites. The aim is to correlate the fractionation trends of the oxides studied and of the rock-forming silicates, and to contribute to the development of exploration guidelines.

INVERTEBRATE/INVERTÉBRÉS

682. BAMBER, E.W., Geol. Surv. Can.:
Carboniferous and Permian biostratigraphy and coral faunas, western and northern Canada, 1971-.

683. BARNES, C.R., Memorial Univ. (Earth Sciences):
Upper Ordovician conodont biostratigraphy of potential oil shales, subsurface southern Ontario, 1983-85.

684. BARNES, C.R., FAHRAEUS, L.E., Memorial Univ. (Earth Sciences):
Ordovician and Silurian conodont biostratigraphy and paleoecology, Anticosti Island, Quebec, 1975-90.

685. BARNES, C.R., FAHRAEUS, L.E., POHLER, S., JOHNSTON, D., KENNA, K., Memorial Univ. (Earth Sciences):
Cambrian and Ordovician conodont biostratigraphy and paleoecology, Cow Head and St. George Groups, western Newfoundland, 1981-; PH.D. thesis (Pohler), M.Sc. theses (Johnston, Kenna).

686. BARNES, C.R., WATSON, S., WEBBY, B.D., COOPER, B.J., Memorial Univ. (Earth Sciences):
Ordovician conodont biostratigraphy and paleoecology, Georgina, Carning and Amadeus Basins, and central New South Wales, Australia, 1980-88; M.Sc. thesis (Watson).

687. BOLTON, T.E., Geol. Surv. Can.:
Ordovician-Silurian biostratigraphy, Southampton Island, District of Keewatin, 1970-.

688. CAMERON, B.E.B., Geol. Surv. Can.:
Foraminiferal biostratigraphy of the Pacific Margin, 1969-.

See:

Quaternary deep sea microfauna in the vicinity of offshore spreading ridges, west coast of Canada; Geol. Surv. Can., Paper 84-1A, p. 659, 660, 1984.

689. CAMERON, B.W., Acadia Univ. (Geology):
Possible annelid origin of Devonian shell-boring **Clionoides** Fenton and Fenton, 1983-85.

The type material of the Devonian **Clinoides thomasi** Fenton and Fenton, 1932, a monotypic ichnogenus of shell-borings in silicified brachiopods, from Iowa, consists of annelid-like borings parallel to the shell surfaces. However, the "floor" and "roof" sections are missing and the papillae-like holes resembling clionid borings, such as those of **Cliona**, are diagenetic features related to weathering of beakite rings and associated solution of the matrix filling the brachiopods. These borings may be conspecific with the Ordovician to Permian **Verimiforichnus clarkei** Cameron and **V. clarkei** may be a junior subjective synonym of **C. thomasi**. However, the poor quality of preservation of these diagenetically altered and weathered endoliths makes positive identification impossible.

690. CARTER, E.S., SMITH, P.L., CAMERON, B.E.B., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Jurassic radiolarian biostratigraphy of the upper Maude and lower Yakoun formations, Queen Charlotte Islands, British Columbia, 1981-84; M.Sc. thesis (Carter).

Jurassic Radiolaria of Toarcian to Lower Bajocian age from the Maude and Yakoun formations in the Queen Charlotte Islands are studied. Samples are from localities on Maude Island and the Yakoun River area of southern Graham Island. The fauna in most samples is extremely diverse, abundant and well preserved.

Preliminary results indicate the presence of over fifty-five genera of Spumellaria and Nassellaria with many new species. These will be described and illustrated. The fauna has affinities with other Lower and Middle Jurassic assemblages of Tethyian aspect found in the Mediterranian area and Japan.

An informal zonation scheme for the Queen Charlotte Islands will be proposed defining five radiolarian zones ranging in age from ?Upper Pliensbachian/Lower Toarcian to Lower Bajocian. The absence of the genus **Canutus** from all assemblages of Middle Toarcian age or younger indicates the extinction of the family Canutidae in the Queen Charlotte Islands by Middle Toarcian time. This could provide a significant marker for the upper part of the Lower Jurassic.

691. COPELAND, M.J., Geol. Surv. Can.:
Paleozoic ostracodes of Canada, 1972-.

See:

Steusloffina cuneata (Steusloff), 1895, from Anticosti Island, Quebec; Geol. Surv. Can., Paper 83-1B, p. 201-204, 1983.

692. DIVERGILIO, M., LESPÉRANCE, P.J., PETRYK, A.A., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Biostratigraphie de la Formation d'Ellis Bay, l'Île d'Anticosti, Québec, 1982-84; thèse de doctorat (DiVergilio).

Projet terminé; sujet à continuation plus tard.

693. DIXON, O.A., Univ. Ottawa (Geology):
Ordovician and Silurian heliolitid corals of Anticosti Island, Quebec and Canadian Arctic, 1968-.

694. ELIAS, R.J., Univ. Manitoba (Earth Sciences):
Ordovician solitary rugose corals of North America, 1980-.

See:

Middle and Late Ordovician solitary rugose corals of the Cincinnati Arch region; U.S. Geol. Surv., Prof. Paper 1066-N, 1983.

Late Ordovician solitary rugose corals of the Stony Mountain Formation, southern Manitoba, and its equivalents; J. Paleontol., vol. 57, no. 5, p. 924-956, 1983.

Papers in press deal with taxonomy and biogeography of corals from California and Texas, and paleobiology of North America Ordovician corals. Work is in progress on corals from New Mexico and Texas, Manitoba, Quebec, Minnesota, Georgia, and Alabama.

695. FAHRAEUS, L.E., Memorial Univ. (Earth Sciences):
Histomorphology of decalcified Silurian conodonts and thelodont scales, 1983-85.

A study of the soft tissue matrix of decalicified conodonts and thelodont scales with the purpose of comparing the conodont cells with vertebrate bone cells of comparable age.

696. GRADSTEIN, F.M., Geol. Surv. Can.:
Biostratigraphic history of the Mesozoic-Cenozoic sediments of the Grand Banks, northeast Newfoundland and Labrador shelves (based on Foraminifera and Ostracoda), 1976-.

697. GRADSTEIN, F.M., Geol. Surv. Can.:
Taxonomy, biostratigraphy, paleoecology and paleobiogeography of Mesozoic-Cenozoic agglutinated Foraminifera, 1979-.

698. GRADSTEIN, F.M., Geol. Surv. Can.:
Digital microfossil shape, 1983-.

699. HIGGINS, A.C., Geol. Surv. Can.:
Carboniferous and Permian biostratigraphy and conodont funas, western and northern Canada, 1983-.

700. HOOPER, K., Carleton Univ. (Geology):
Neogene Microfauna from D.S.D.P., S.W. Pacific Oean, 1980-85.

701. KENNEDY, D.J., Brock Univ. (Geological Sciences):
Conodont biostratigraphy, early Paleozoic, Rocky Mountains, Alberta, U.S.A. and Australia, 1982-.

Current work is on the taxonomy and biostratigrapy of Cambrian to Middle Ordovician conodonts from: 1) 2 sections in the Southern Rocky Mountains of Alberta; and 2) a restudy of a Lower Ordovician fauna described by Furnish, 1938 from the Prairie du Chien Group, Minnesota and several faunas from Australia.

702. KNAPP, C.J., ELIAS, R.J., NORFORD, B.S., Univ. Manitoba (Earth Sciences):
Late Ordovician solitary rugose corals of the Beaverfoot Formation, southern Rocky Mountains, Alberta and British Columbia, 1983-85; M.Sc. thesis (Knapp).

703. KUKALOVA-PECK, J., Carleton Univ. (Geology):
Morphology and evolution of Paleozoic insects with reference to phylogeny of recent insects, 1983-.

See:

Origin of the insect wing and wing articulation from the arthropodan leg; Can. J. Zoology, vol. 61, no. 7, p. 1618-1669, 1983.

New Homoiopteridae (Insecta: Paleodictyoptera) with wing articulation from Upper Carboniferous strata of Mazon Creek, Illinois; ibid., p. 1670-1687, 1983.

In the 1983 paper, a new theory of insect wing origin was proposed, according to combined documentation of (a) fossil record, (b) developmental genetics, (c) physiology, (d) embryology, and (e) tissue transplant. The wings are derived from epicoxal exites (= outer appendages of the five upper leg segments in arthropods). Epicoxa was added to euarthropodan leg, bringing total number to eleven segments. New theory of formation of insect wing venation was introduced as well as new interpretation of the head and abdominal sides.

The resolutionary changes in understanding insects proposed above must be thoroughly documented. New principles are now being applied to the wing venation of dragonflies and mayflies, both fossil and living, to demonstrate the advantages for understanding phylogeny of the groups. Other orders will follow.

Oldest holometabolous and hemipteroid larvae are studied. Head of the oldest hemipteroid insects with inflated pumping mechanism are being researched.

704. MATTHEWS, J.V., Jr., Geol. Surv. Can.:
Late Cenozoic fossil insects and Late Cenozoic paleoecology, 1973-.

705. MCAULEY, R.J., ELIAS, R.J., Univ. of Manitoba (Earth Sciences):
Uppermost Ordovician stratigraphy and solitary rugose corals of the east-central United States, 1980-85; M.Sc. thesis (McAuley).

706. MCGUGAN, A., Univ. Calgary (Geology and Geophysics):
Relation of living benthic Foraminifera to substrate, 1983-.

Scuba based sampling of microenvironments down to ±20 m (turbulent zone). Collecting and measurement of living standing crops of Foraminifera.

707. MCNEIL, D.H., Geol. Surv. Can.:
Mesozoic and Cenozoic Foraminifera of the Arctic western mainland of Canada, 1978-.

708. MUNRO, I., DIXON, O.A., NOWLAN, G.S., Univ. Ottawa (Geology):
Conodont biostratigraphy of Lower Ordovician rocks in the Ottawa-Brockville-Montreal region, 1983-87; PH.D. thesis (Munro).

709. NAUSS, A.L., SMITH, P.L., CAMERON, B.E.B., ROUSE, G., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Foraminiferal biostratigraphy of the Upper Yakoun Formation (Jurassic) in Alliford Bay syncline, Queen Charlotte Islands, British Columbia, 1983-85; M.Sc. thesis (Nauss).

To examine the biostratigraphy of the Callovian upper Yakoun Formation cropping out at Alliford Bay, Queen Charlotte Islands, in order to arrive at a Callovian zonation scheme.

Jurassic sedimentary rocks in the Queen Charlotte Islands are potential source rocks for possible oil reserves in the area. The depositional environment and potential source rock qualities of the Callovian sequence of the Yakoun Formation will be examined.

710. NORRIS, A.W., Geol. Surv. Can.:
Brachiopods of the lower Upper Devonian Waterways Formation of northeastern Alberta, 1977-.

See:

Brachiopods [**Schizophoria, Strophodonta (Strophodonta), Nervostrophia, Eostrophalosia** and **Devonoproductus**] from the lower Upper Devonian Waterways Formation of northestern Alberta; Geol. Surv. Can., Bull. 350, 1983.

711. NOWLAN, G.S., Geol. Surv. Can.:
Paleozoic conodonts of eastern Canada, 1977-.

See:

Middle Ordovician conodonts from the Buchans Group, central Newfoundland, and their significant for regional stratigraphy of the Central Volcanic Belt; Can. J. Earth Sci., vol. 21, no. 3, p. 284-296, 1984.

Early Silurian conodonts of eastern Canada; Fossils and Strata, No. 15, p. 95-110, 1983.

712. ORCHARD, M.J., Geol. Surv. Can.:
Conodont biostratigraphy and biogeography in the Canadian Cordillera, 1981-.

713. PARKINS, W.G., DIXON, O.A., Univ. Ottawa (Geology):
Late Silurian rugose corals of Somerset and Cornwallis Islands, Arctic Canada, 1977-84; Ph.D. thesis (Parkins).

714. PEMBERTON, S.G., Alberta Research Council (Geol. Surv.):
Trace fossils from the Cardium Formation, Cretaceous, Alberta, 1981-84.

See:

Ichnology of a shallow water storm influenced deposit; the Cardium Formation at Seebe, Alberta; Can. Soc. Petrol. Geol., Mem. 9, 1984.

Biogenic structures in Upper Cretaceous outcrops and cores; ibid., Fieldguide Mesozoic Conf., 1983.

Detailed ichnological studies have been conducted on the Upper Cretaceous Cardium Formation of southwestern Alberta. The formation crops out in a belt trending northwest to southeast from Hinton to Seebe. To date 20 ichnospecies have been documented. Analysis of the nature and distribution of these ichnofossils, suggests that the sandstone units in the Cardium Formation were deposited as storm events.

715. POPE, C.S., NOBLE, J.P.A., Univ. New Brunswick (Geology):
The taxonomy and paleoecology of the stromatoporoid fauna of the West Point Formation (Silurian), Gaspe Peninsula, Quebec, 1980-84; M.Sc. thesis (Pope).

Since stromatoporoids are a major part of the fauna in the lower half of the West Point Formation and are the major reef-building organism in the upper half, a taxonomic and morphopaleoecologic study of these stromatoporoids has been undertaken. This study of species distributions and morphologic adaptations to the various environments will be used to support or modify Bourque's (1980) facies analysis.

716. RIVA, J.F., Université Laval (Géologie):
Upper Ordovican graptolites, taxonomy and biostratigraphy, 1966-86.

See:

Overlapping thrust belts of Late Paleozoic and Mesozoic ages, No. Elko Co., Nevada; Geol. Soc. Amer., Mem. 157, p. 303-327, 1983.

The position of the **bifidus** zone of Utah; Geol. Soc. Amer., Abstracts with Program, vol. 15, no. 5, p. 409, 1983.

717. SARJEANT, W.A.S., LEONARDI, G., Univ. Saskatchewan (Geological Sciences):
Terrestrial paleoichnology-general studies, 1981-85.

See:

Further vertebrate footprints from the Lower Permian sandstones of Cumbria; Proc. Cumberland Geol. Soc., vol. 4, pt. 2, p. 111-114, 1983.

The footprints of extinct animals; Scientific Amer., vol. 248, no. 1, p. 74-85, 1983.

Terrestrial trace fossils; Benchmark Papers in Geology/76 Stroudsburg, Penn., Hutchinson Ross Publishing Co., 1983.

Durig November 1983 I worked with Dr. Giuseppe Leonardi in the province of Rio Grande do Sul, Brazil. During this time, footprints of early Jurassic protomammals were discovered at two localities and of a Permian amphibian at one locality, all new.

We worked also on the final draft of a multilanguage glossary of the terminology applied to fossil vertebrate footprints, which should be sent to press shortly.

718. SCHROEDER, C., GRADSTEIN, F.M., MEDIOLI, F., SCHOFF, D., Dalhousie Univ. (Geology):
Taxonomy and ecology of deep water arenaceous Foraminifera, 1983-85.

719. SCOTT, D.B., MEDIOLI, F.S., BOYD, R., GREENBERG, D.A., Dalhousie Univ. (Geology), Bedford Instit. Oceanography:
Sea-level rise in the Maritime Provinces, particularly on Sable Island, 1977-.

See:

Relative sea-level rise and tidal development in the Fundy tidal system; Can. J. Earth Sci., vol. 20, no. 10, p. 1559-1564, 1983.

720. SCOTT, D.B., MEDIOLI, F.S., MUDIE, P.J., VILKS, G., SCHAFER, C.T., FADAR, G., Dalhousie Univ. (Geology), Geol. Surv. Can.:
Quaternary paleoceanography of Eastern Canada, 1980-; PH.D. thesis (Scott).

721. SLAM, B., GRADSTEIN, F.M., MEDIOLI, F., SCOTT, D.B., Dalhousie Univ. (Geology):
Jurassic micropaleontology of Portugal and Grand Banks, 1983-85; Ph.D. thesis (Slam).

722. SMITH, P.L., Univ. British Columbia (Geological Sciences):
Early Jurassic biostratigraphy of western North America.

See:

The stratigraphy and biofacies trends of the lower Mesozoic Gabbs and Sunrise formations, west-central Nevada; Can. J. Earth Sci., vol. 10, p. 1598, 1983.

723. STEARN, C.W., McGill Univ. (Geological Sciences):
Stromatoporoids from allochthonous blocks in the Stuart Bay Formation (Lower Devonian), Bathurst Island, Arctic Canada, 1982-84.

724. STEARN, C.W., McGill Univ. (Geological Sciences):
Revision of the Devonian stromatoporoid faunas of western and Arctic Canada, 1984-.

725. STELCK, C.R., KOKE, K., BREDIN, C., Univ. Alberta (Geology):
Mid-Cretaceous biostratigraphy of Western Canada, 1947-; M.Sc. thesis (Koke).

See:

Foraminifera of the lower part of the Sully Formation (upper Albian), northeastern British Columbia; Can. J. EarthSci., vol. 20, p. 1248-1259, 1983.

At present, writing up the "Haplophragmoides gigas Zone in northeastern British Columbia". Continuing work on the microfaunas of the middle portion of the Hasler Formation of northeastern British Columbia.

726. THOMSON, R.C., SMITH, P.L., TIPPER, H.W., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Lower Jurassic ammonite biostratigraphy of the northern Bowser Basin, north-central British Columbia, 1983-85; M.Sc. thesis (Thomson).

See:

Lower and Middle Jurassic sediments and volcanics of the Spatsizi map area, British Columbia; Geol. Surv. Can., Paper 84-1A, p. 117-120, 1984.

To examine the biostratigraphy of a sequence of Lower to early Middle Jurassic sediments exposed in the northern part of the Bowser Basin. The emphasis of the study will be placed on detailed systematic paleontology of the ammonite faunas collected in the area. Use of computerized data-base systems will be made in the course of the systematics work.

Comparisons will be made between the ammonite faunas from this area and other western North American, Pacific Rim and European faunas. The paleogeographic implications of these data, particularly with regard to the tectonic evolution of the Canadian Cordillera, will also be considered.

727. TOZER, E.T., Geol. Surv. Can.:
Canadian Triassic Ammonoidea and Bivalvia, 1967-.

728. UYENO, T.T., Geol. Surv. Can.:
Conodont biostratigraphy of Siluro-Devonian rocks of the Arctic Islands, 1968-.

729. VILKS, G., Geol. Surv. Can.:
Quaternary biostratigraphic methods for marine sediments, 1983-.

730. WALL, J.H., Geol. Surv. Can.:
Reconnaissance of Mesozoic Forminifera of Arctic Islands, 1972-.

See:

Jurassic and Cretaceous foraminiferal biostratigraphy in the eastern Sverdrup Basin, Canadian Arctic Archipelago; Bull. Can. Petrol. Geol., vol. 31, no. 4, p. 286-281, 1983.

731. WALL, J.H., Geol. Surv. Can.:
Triassic Foraminfera of the Sverdrup Basin, District of Franklin, 1979-.

732. WILSON, M.V.H., WIGHTON, D.C., Univ. Alberta (Zoology):
Fosil insects from the Paleogene of western Canada, 1975-.

See:

Further observations on North American Tertiary orthoperoids (Insecta: Grylloptera); Can. J. Earth Sci., vol. 20, no. 2, p. 217-224, 1983.
Is there a characteristic rate of radiation for the insects?; Paleobiology, vol. 9, p. 79-85, 1983.

VERTEBRATE/VERTÉBRÉS

733. CARROLL, R.L., McGill Univ. (Redpath Mus.):
Evaluation of constraints on the evolution of aquatic reptiles, 1983-86.

Many different groups of reptiles become specialized for an aquatic way of life during the late Paleozoic and early Mesozoic. These provide a basis for evaluating a broad range of evolutionary constraints: 1) ancestral pattern of anatomy and physiology; 2) developmental canalization; 3) functional constraints; and 4) behaviour and central nervous system constraints.

A prelimnary study, submitted for publication, suggests that functional constraints of locomotion within an aquatic medium are the most important limiting factors of evolution in this group. Work is now continuing on the constraints which may have been acting at the time of the initiation of each of several patterns of aquatic locomotion.

734. CARROLL, R.L., McGill Univ. (Redpath Mus.):
Change in developmental pattern in the evolution of Paleozoic amphibians, 1983-87.

A large collection of amphibians from the Upper Carboniferous of Czechoslovakia is being studied in the Natural History Museum in Vienna. This material includes growth series of many genera included within both the labyrinthodonts and the lepospondyls. Both the adult anatomy and the growth pattern of these groups are significantly different, making the nature of their interrelationships difficult to establish. It is hoped that a thorough study of their growth will help to establish the nature of the developmental patterns in both groups, which may reveal the basis for the anatomical differences in the adults.

735. CARROLL, R.L., CURRIE, P.J., McGill Univ. (Redpath Mus.), Tyrrell Mus. Paleontol.:
Primary radiation of diapsid reptiles, 1978-1984.

736. CARROLL, R.L., GASKILL, P., McGill Univ. (Redpath Mus.):
Analysis of the possible relationships between Nothosaurs and Plesiosaurs, based on skeletal anatomy and pattern of aquatic locomotion, 1976-85.

737. CARROLL, R.L., WILD, R., McGill Univ. (Redpath Mus.), State Mus., Stuttgart:
Description of a new pleurosaur from the Lower Jurassic of Germany and evaluation of relationships of the splenodontides, 1984.

738. DINELEY, D.L., LOEFFLER, E.J., LIU, Y-h., Univ. Bristol (Geology):
Cyathaspidids from the Peel Sound and other formations of Somerset and Prince of Wales Islands, Northwest Territories, 1964-84.

See:

New species of **Protopteraspis** (Agnatha, Heterostraci) from the (?) Upper Silurian to Lower Devonian of Northwest Territories, Canada; J. Paleontol., vol. 57, p. 474-494, 1983.

New Pteraspididae (Agnatha, Heterostraci) from the Lower Devonian of Northwest Territories, Canada; J. Vert. Paleontol., vol. 2, p. 389-406, 1983.

A new subfamily of the Pteraspididae (Agnatha, Heterostraci) from the upper Silurian and lower Devonian of Arctic Canada; Palaeontology, vol. 27, p. 169-198, 1984.

To complete the description of the vertebrate faunas from Prince of Wales and Somerset Islands, and to discuss their distribution, evolution and palaeoecology. Work on the pteraspids and arthrodires is now completed.

The cyathaspids and traquairaspids still present a number of forms which remain to be described in detail. The descriptions of the larger **Pionaspis**-like species are almost complete. The others are progressing.

739. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Tertiary and Quaternary radiation of th giant armadillos (Pampatheriidae: Mammalia) in South America, 1964-85.

See:

The fossil giant armadillos of North America (Pampatheriinae, Xenarthra = Edentata); in: The Evolution and Ecology of Sloths, Anteaters and Armadillos (Mammalia, Xenarthra = Edentata), Smithsonian Inst. Press, Washington, DC, 1983.

Analysis of data confirms the presence of two major lineages of giant armadillos. One, with relatively unornamented osteoderms is generally confined to Argentina, Uruguay and Bolivia, but with diagnostic specimens identified from two localities in Mexico. The second major lineage, typified by the North American genus **Holmesina**, bears well-ornamented osteoderms. An undescribed series of specimens from the later Miocene of Colombia may be ancestral, and an excellent chronocline from Late Pliocene to Late Pleistocene documents its history in Florida. The pamapthere faunas of the Pleistocene of Brasil, Venezuela, Peru and Ecuador are assigned to the same radiation. Several new forms from South America are being described, while other genera and species will become synonymous.

740. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Osteology and functional morphology of the Pleistocene giant armadillo **Holmesina septentrionalis** (Pampatheriidae, Xenarthra, Mammalia), 1985-.

Dissection of preserved Recent armadillos has aided in the interpretation of skull structures in fossil **Holmesina**. Compilation of metric data and illustrations continues, with manuscript completion expected by 1985.

741. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
Evolution of a single phyletic line of giant armadillos (Pampatheriidae, Mammalia) in Florida during the Pleistocene, 1975-85.

Completion of the manuscript on the well-documented chronocline leading from the late Pliocene **Holmesina floridanus** to the late Pleistocene **H. septentrionalis** has been delayed, pending closer study of the possibly ancestral species from the Miocene of Columbia. Assignment of the latter to the genus **Kraglievichia** by earlier authors is incorrect, and the Colombian species may prove a possible ancestor to all of the northern forms with well-ornamented osteoderms.

742. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
New species of giant armadillos (Pampatheriidae, Edentata) from the Late Pleistocene of Texas and Mexico, 1977-85.

Suites of osteoderms recovered from two sites in Mexico are indistinguishable from those of **Vassallia** of Argentina. In addition to the morphology, the proportion of rectangular osteoderms is over 50%, a characteristic of the pelvic buckler in the **Vassallia-Pampatherium** lineage. No concurrences of this lineage are known between Mexico and the southern half of South America.

743. EDMUND, A.G., Univ. Toronto (Geology):
Study of deposits containing Pleistocene vertebrates in Charlotte and Sarasota Counties, Florida, 1978-.

A Summer Canada project in 1983 permitted the identification and cataloguing of the first 3000 vertebrate specimens in the ROM's collection from the Plio-Pleistocene of Florida. Two new sites were located, one of Irvingtonian age, probably a pond deposit, the other is of post Wisconsin age, with a rich fauna of small aquatic and terrestrial vertebrates. Both sites will be extensively excavated in 1984 with close attention to elevations and paleoecological sampling.

744. EDMUND, A.G., Royal Ontario Mus. (Vert. Palaeontology):
The body armour of giant armadillos (Pampatheriidae, Xenarthra, Mammalia), 1980-83.

See:

The giant armadillos of the Pleistocene of North America; in The Evolution and Ecology of the Xenarthra, Smithsonian Inst. Press, Washington, DC., 1983.

Osteoderms typical of the various areas of the body are now described with considerable confidence. Good suites typical of several taxa are now known, although articulated or associated material is rare. Osteoderms from the non-marginal areas of the carapace have typical ornamentation and can be used for taxonomy. At least two major lineages were detected, one with almost featureless osteoderms, the other with osteoderms bearing a raised margin and a median central figure. In the latter, as typified by **Holmesina**, almost all buckler osteoderms are polygonal. In the other lineage, containing **Pampatherium** and **Vassallia** the pelvic osteoderms are mostly rectangular.

745. FOX, R.C., Univ. Alberta (Geology, Zoology):
Non-marine Upper Cretaceous vertebrates from western Canada, 1965-.

A continuing investigation of the paleontology, stratigraphic and geographic distribution, and the relationships of non-marine Upper Cretaceous vertebrates from western Canada.

746. FOX, R.C., CAMPBELL, K.S.W., Univ. Alberta (Geology), The Australian Nat. Univ. (Geology):
Amphibians and freshwater fishes from the Upper Devonian of Australia, 1983-.

Paleontology of the origin of the Amphibia, from fossils ocurring in bone beds from the non-marine Upper Devonian of the Jemalong Range, exposed near Forbes, New South Wales.

747. FOX, R.C., YOUZWYSHYN, G., STONLEY, G., Univ. Alberta (Geology, Zoology):
Paleocene mammals from the vicinity of Swan Hills, Alberta; Paleocene mammals from the vicinity of Cochrane, Alberta, 1983-85; M.Sc. theses (Youzwyshyn, Stonley).

See:

First North American record of the Paleocene primate **Saxonella**; J. Paleontol., vol. 58, no. 3, p. 892-894, 1984.

Notes on the North American Tertiary marsupials **Herpetotherium** and **Peradectes**; Can. J. Earth Sci., vol. 20, p. 1565-1578, 1983.

New evidence on the relationships of the Tertiary insectivoran **Ankylodon** (Mammalia); Can. J. Earth Sci., vol. 20, p. 968-977, 1983.

A continuing investigation of the paleontology, stratigraphic and geographic distribution and the relationships of Paleocene mammals from western Canada.

748. GODFREY, S.J., CARROLL, R.L., McGill Univ. (Biology):
The postcranial skeletal anatomy of **Greererpeton burkemorani**, a Paleozoic temnospondyl amphibian, 1981-85.

749. MADDEN, C.T., STORER, J.E., Denver Museum Nat. Hist., Saskatchewan Museum Nat. Hist.:
Proboscidea of the Wood Mountain Formation (Barstovian) of southern Saskatchewan, 1981-84.

750. MCDONALD, H.G., EDMUND, A.G., Univ. Toronto (Geology), Royal Ontario Mus. (Vert. Palaeontology):
A description of **Scelidodon** from the Pleistocene tar seeps of Ecuador and Peru, and review of the selidotheres (Mylodontidae, Mammalia), 1978-83; Ph.D. thesis (McDonald).

McDonald has examined all pertinent specimens in North America and European museums, and will complete a survey of South America museums in the spring of 1984. He has concluded that **Scelidodon** and **Scelidotherium** are clearly separatable at the generic level. **Scelidotherium** is represented by a single late Pleistocene species, **S. leptocephalum**. **Scelidodon** includes **S. chilliense** (with several synonyms) and **S. cuvieri** of Brasil. Studies continue on the relationships between scelidotherines, mylodontines and lestodontines.

751. MOSSMAN, D.J., Mount Allison Univ. (Geology):
Vertebrate footprints from Mississippian and Pennsylvanian sediments of Nova Scotia – compilation and description of all known forms, 1974-.

752. PAGEAU, Y.N., Univ. Québec à Montréal (Sciences de la Terre):
Nouveaux documents pour **Forillonaspis lehmani**, 1982-83.

Les fouilles de lété 1983 n'ont rich apporté du neuf. Les fouilles de l'été '84 permettront de trouver des plaques du crane de **Forillonaspis** qui n'est decrit à ce moment que par des plaques thoraciques.

753. RIOSA, J.A., Royal Ontario Mus. (Vert. Paleontology):
Osteology, taxonomy and distribution of the giant ground sloths of the genus **Eremotherium** (Xenarthra, Mammalia), 1960-85.

Study of the manus of North and South American specimens of **Eremotherium** was undertaken. This indicated three distinct size ranges of individuals. **Eremotherium elenense** Hoffstetter (with several synonyms) is a relatively small animal confined to western South America from Peru to Chile. Especially large individuals are known mainly from isolated bones from North America. The remainder of the specimens, including several associated skeletons, are by far the most numerous, and range from Brasil and Peru to New Jersey, U.S.A. They have received names such as **E. rusconii, mirabile** and **laurillardi**, some of which are certainly synonyms. In this group some individuals have a well-developed digit II, with a claw, on the manus, while in most this digit is rudimentary. This is associated with other morphological changes in the forefeet, and may be of sexual or taxonomic significance.

754. SEYMOUR, K.L., EDMUND, A.G., Univ. Toronto (Geology), Royal Ontario Mus. (Vert. Palaeontology):
The Felinae (Mammalia:Felidae) from the late Pleistocene tar seeps at Talara, Peru. With a critical examination of the fossil and Recent Felines of North and South America, 1981-83.

Fossils of three species of extant true cats (Felinae) are described from the late Pleistocene tar seeps at Talara, Peru: **Panthera onca**, jaguar; **Felis concolor**, puma; and **Felis** cf. **wiedii**, margay. Jaguar fossils from Talara are among the largest known. All large cat fossils from Talara can be referred to either **P. onca** or **Smilodon neogaeus**, thus removing the lion, **P. leo (P. atrox)** from the faunal lists of Talara and South America. Very large jaguar is exceedingly difficult to distinguish from fossil lion. Tooth size and proportions are less diagnostic than are overall limb and skull size. The size variation seen in the Talara fossils is probably due to sexual dimorphism, here reported for the first time in fossil jaguar from one site. On the basis of cranial and dental measurements, the extant jaguar is sexually dimorphic, the male averaging 9.5% larger than the female. Earlier work suggested the extant jaguar varied in size according to Bergmann's Rule. Larger sample sizes now show this not to be the case. With a change in size, postcranial proportions are relatively more consistent than cranial and dental proportions and hence are more diagnostic. Using cranial and dental measurements, the Pleistocene jaguar averages 15% larger than the extant, and 25% larger using postcranial elements. It is suggested that the extant jaguar is a phenotypic dwarf of the fossil jaguar and that this dwarfing was primarily a latest Pliestocene phenomenon. Fossil and extant jaguar are considered to be the same species, with no subspecific status for the larger Pleistocene form.

755. SKWARA, T., KUPSCH, W.O., Univ. Saskatchewan (Geological Sciences):
Vertebrate paleontology of Early Miocene deposits from the Cypress Hills of southwestern Saskatchewan, 1980-84; Ph.D. thesis (Skwara).

756. STORER, J.E., Saskatchewan Museum Nat. Hist.:
Oligocene-Eocene mammals of the Cypress Hills Formation (Chadronian-Uintan) of Saskatchewan, 1979-.

See:

A new species of the artiodactyl **Heptacodon** from the Cypress Hills Formation, Lac Pelletier, Saskatchewan; Can. J. Earth Sci., vol. 20, no. 8, p. 1344-1347, 1983.

A review of the early Chadronian Southfork local fauna and a monograph on the late Uintan Swift Current Creek local fauna are near completion. 1983 field work in the Lac Pelletier area established microvertebrate localities representing two faunal levels. Both local faunas appear to correlate near the Eocene-Oligocene boundary. Both microvertebrate localities will be worked intensively in 1984.

757. SUES, H.-D., CARROLL, R.L., McGill Univ. (Redpath Mus.):
The origin of the Plesiosauria, 1984-86.

To clarify the relationships of the large marine reptiles referable to the Plesiosauria and to trace the development of their highly specialized locomotor apparatus. Comparisons will be made between the Plesiosauria and more primitive sauropterygians, especially with regard to the structure of the appendicular skeleton.

758. WALSH, D.M., CARROLL, R.L., McGill Univ. (Redpath Mus., Biology):
Barasaurus a primitive procolophonoid from the Upper Permian of Madagascar, 1983-; PH.D. thesis (Walsh):

A detailed description of **Barasaurus**, from the Upper Permian of Madagascar in an attempt to elucidate the relationships of the procolophonoids.

759. WELLSTEAD, C.F., CARROLL, R.L., McGill Univ. (Redpath Mus.):
Revision of the extinct amphibian family Lysorophidae, 1977-84; Ph.D. thesis (Wellstead).

760. WILSON, M.V.H., Univ. Alberta (Zoology):
Eocene fossil fishes of western North America, 1975-.

See:

Year classes and sexual dimorphism in the Eocene catostomid fish **Amyzon aggregatum**; J. Vert. Paleontol., vol. 3, p. 137-142, 1984.

761. WILSON, M.V.H., Univ. Alberta (Zoology):
Eocene lake environments: depth and distance-from-shore variation in fish, insect, and plant assemblages, 1975-.

Current emphasis is on testing the distance-from-shore model against data from previously unknown fossil assemblages, and on improving the ability to discriminate between the extremes of variation observed.

762. WILSON, M.V.H., Univ. Alberta (Zoology):
Paleocene freshwater fishes of western Canada, 1978-.

A paper is in press in Palaeontology describing in detail the osteology of the oldest known fossil esocid (pike), **Esox tiemani**. The species has most of the typical pike adaptations, but is intermediate between living pikes and living umbrids (mudminnows) in its branchiostegal rays and opercle.

763. WILSON, M.V.H., Univ. Alberta (Zoology):
Shape analysis of fossils using microcomputer-based digitizers and plotters, 1981-.

See:

Digitizing outlines of fossil specimens using video frame capture; Can. J. Earth Sci., vol. 20, no. 11, p. 1747-1751, 1983.

A software package has been developed for Apple II and compatible computers, to digitize outlines of fossil specimens using either a graphics tablet or a video frame-capture digitizer. Outlines and their tangent-angle functions can be plotted, superimposed, on either the high-resolution screen or on an X-Y plotter.

764. WILSON, M.V.H., Univ. Alberta (Zoology):
Marine Mesozoic fishes of western Canada, 1983-.

Marine Mesozoic fish localities have been discovered in Triassic, Jurassic, and Cretaceous rocks of western Canada. Preliminary work on these faunas is designed to identify the taxa present, prior to more detailed work on their systematic and stratigraphic significance.

765. ZODROW, E.L., BRAY, T., Univ. College of Cape Breton (Geology):
Crossopterygian remains (scales) in an algal limestone, Sydney Coalfield, Nova Scotia, 1984-.

This is the first-reported occurrence of crossopterygians (**Megalichthys**) in the Sydney Coalfield and thus helps in defining the paleogeogrpahic distribution of this group of fishes.

PALEOBOTONY/PALYNOLOGY/ PALÉOBOTANIQUE ET ANALYSE POLLINIQUE

766. ACHAB, A., INRS-Géoressources:
Chitinozoaires de l'Ordovicien inférieur et moyen du Québec.

Voir:

Chitinozoaires du Llanvirn (Formation de Table Head) de la partie occidentale de Terre-Neuve; Can. J. Earth Sci., vol. 20, p. 918-931, 1983.

Reconnaissance des principaux assemblages de chitinozoaires de l'Ordovicien inférieur et moyen du Québec. Leur succession est mise en relation avec la zonation établie à l'aide de graptolites.

767. ACHAB, A., ASSELIN, E., NOWLAN, G.S., INRS-Géoressources, Geol. Surv. Can.:
Biostratigraphie par les chitinozoaires de l'Ordovician supérieur-Silurien inférieur de la Gaspésie et du Nouveau-Brunswick, 1983-84.

Les principaux assemblages de chitinozoaires de l'Ordovicien supérieur-Silurien inférieur de Gaspésie et du Nouveau-Brunswick sont décrits et comparés à ceux du même âge précédemment rencontrés à Anticosti.

768. BARSS, M.S., Geol. Surv. Can.:
Palynological zonation of the Carboniferous and Permian rocks of Atlantic Provinces, Gulf of St. Lawrence and northern Canada, 1968-.

769. BASINGER, J.F., Univ. Saskatchewan (Geological Sciences):
Early Tertiary plants of southern Yukon, 1983-.

Fossil plants occur in several of the isolated Tertiary coal basins of central and southern Yukon. These basins are generally associated with the Tintina and Shakwak trenches. Fossil assemblages are typically of low diversity, with the ubiquitous Paleocene plants, **Metasequoia, Glyptostrobus,** birch?, and **Cercidiphyllum** predominant. Some floras show similarity to those of the Eureka Sound Formation of the Arctic islands; others are more comparable to floras of southern Saskatchewan and Alberta. Differences among floras may be the product of climatic variation in time or space or the product of peculiarities of communities sampled. The Yukon early Tertiary fossils are contributing to our appreciation of diversity and plant distribution in early northern temperate floras.

770. BASINGER, J.F., DILCHER, D.L., Univ. Saskatchewan (Geological Sciences):
Early Tertiary plants of the Canadian High Arctic, 1982-.

Fossil plants are preserved in coal-bearing sediments of the Eureka Sound Formation of the Canadian High Arctic. The Eureka Sound Formation is from Late Cretaceous to Eocene in age and represents the final phase of sedimentation in the Sverdrup Basin. Fossils were recovered from Paleocene beds exposed near Eureka, Ellesmere Island. The fossil floras are generally of low diversity, with **Metasequoia, Glyptostrobus, Cercidiphyllium,** and birch? predominating. Numerous coal seams occur in this part of the formation and appear to have been formed by the taxodioid conifers. Most species were extremely widespread during the early Tertiary, appearing in floras from Spitzbergen to Saskatchewan to Siberia. Associated with these widespread species are plants that seem to be most comparable to plants of the mid to late Tertiary of lower latitudes, indicating that southward migration of some high latitude taxa may have been important in evolution of northern temperate floras.

771. BASINGER, J.F., SCHECKLER, S.E., Univ. Saskatchewan (Geological Sciences):
Devonian plants associated with lead/zinc deposits of eastern Yukon, 1982-87.

Fossil plants have been discovered in turbidites of the Earn Group near Macmillan Pass, eastern Yukon. Lead/zinc mineralization occurred locally within the turbidites. Metamorphism in the area has destroyed palynomorphs and biostratigraphic correlation within the sequence is generally not possible. Fragments of an early, forest-forming tree, **Archaeopteris fissilis,** were found in some of the finer-grained partings within the turbidites. These were rafted out to sea and incorporated in the sediments as they sank. **Archaeopteris fissilis** is characteristic of the Late Devonian and is known only from higher latitudes. Absence of **Rhacophyton,** normally abundant in rocks of Famennian age, indicate that the Yukon plant beds are probably Frasnian in age. These fossil plants allow us to date relatively accurately some of the lead/zinc ore bodies of eastern Yukon and may be of use in correlation and exploration in the area. These remains of **A. fissilis** are also the best preserved materials of this species known and are contributing to a better understanding of evolution of early gymnospermous plants.

772. BÉLIVEAU, M., GEURTS, M.-A., Univ. Ottawa (Géographie):
Reconstitution des successions écologiques à court terme dans les sols forestiers (Parc de la Gatineau), Québec, 1980-84; thèse de maîtrise (Béliveau).

La détermination des successions écologiques et la palynologie de surface des relevés en forêt conduit à la détermination de spectre pollinique types pour la chênaie, l'ostryere et l'érablière. L'analyses pollinique des profiles des sols forestiers reconstitue les successions écologiques à court terme.

773. CAMERON, B.W., Acadia Univ. (Geology):
Algal and fungal shell-borings from the late Cretaceous and early Tertiary of the New Jersey coastal plain, 1983-86.

The Late Cretaceous Navesink and Mt. Laurel and the Early Tertiary Hornerstown and Vincentown formations of the New Jersey coastal plain contain diverse, abundant, and well-preserved endolithic assemblages in oyster, belemnoid, brachiopod, scaphopod, echinoid, foraminiferan and bryozoan skeletons. In addition to algae and fungi, endolithic organisms are also represented by clinoid sponges, bivalves, gastropods, annelids, phoronids(?), acrothoracian barnalces, and bryozoans.

The microbial borings, ranging from 1 to 100 microns in diameter, are being resin-imbedded and studied by SEM after acid dissolution of their calcareous skeletal substrates. They are interpreted as representing small fungal hyphae with reproductive sacs and larger branching algal filaments. The algae include probable red algae (Rhodophyta) and green algae (Chlorophyta). The calcitic Cretaceous belemnoids and Tertiary oysters contain the best-preserved microbial endoliths. These endolithic algae do not contradict, at this time, previous paleobathymetric estimates for these formations.

774. DAVIES, E.H., Geol. Surv. Can.:
Biostratigraphy of the Atlantic Shelf and relevant areas, 1981-.

See:

Early Cretaceous deposits in the Gays River lead-zinc mine, Nova Scotia; Geol. Surv. Can., Paper 84-1A, p. 353-358, 1984.

775. DAVIES, E.H., Geol. Surv. Can.:
Taxonomy, phylogeny and ecology of palynomorphs, 1981-.

776. DE BASTIANI, P., GEURTS, M.-A., Univ. Ottawa (Géographie):
Evolution paléoécolgique et géomorphologique de la zone du Williscroft Creek (Chaîne de Kluane, Sud Ouest du Yukon), 1983-85; thèse de maîtrise (deBastiani).

L'étude vise à reconstituer l'évolution de la végétation et du relief depuis 5400 ans sur le versant sud du lac Kluane.

777. DONALDSON, J.A., HORODYSKI, R.J., Carleton Univ. (Geology), Tulane Univ:
Stromatolites and microfossils of the Dismal Lakes Group, Northwest Territories, 1977-84.

Additional material from underlying Hornby Bay Group now under study.

778. EDLUND, S.A., Geol. Surv. Can.:
Vegetation distribution and relationships to surficial materials, Arctic Canada, 1976-.

See:

Reconnaissance vegetation studies on western Victoria Island, Canadian Arctic Archipelago; Geol. Surv. Can., Paper 83-1B, p. 75-81, 1983.

Morphology and description of an outlier population of tree-sized willows on western Victoria Island, District of Franklin; Geol. Surv. Can., Paper 84-1A, p. 279-285, 1984.

779. GEURTS, M.-A., Univ. Ottawa (Géographie):
Palynostratigraphie du tardiglaciaire et du Postglaciaire, Territoires du Nord Ouest et sud Ouest du Yukon, 1984.

Voir:

Relations entre spectres polliniques comtemporains et topographie dans la vallée de la Coppermine, Territoires du Nord Ouest; J. Canadien de Botanique, vol. 61, p. 586-593, 1983.

Palynologie et morphogenèse récente dans le bassin du Grizzly Creek (Territoire du Yukon); Can. J. Earth Sci., vol. 22, p. 1543-1553, 1983.

La recherche sur les fondements de l'interprétation palynologique en milieu nordique aboutit à l'élaboration d'un modèle d'interprétation basée sur les données de la palynologie de surface, de l'aéropalynologie et des relations entre spectres actuels, végétation et topographie. Ce modèle est applicable à l'interprétation des sédiments fossiles.

780. GUAY, F., GEURTS, M.-A., Univ. Ottawa (Géographie):
Evolution paléoclimatique paléophyto-géographique et géomorphologique de la vallée de la Coppermine durant l'Holocène, 1980-84; thèse de maîtrise (Guay).

Voir:

Les terrasses fluviales dans la vallée de la Coppermine, Territoires du N.O.; Géoscope, vol. 7, p. 51-58, 1983.

L'étude palynologique d'un matériel de remplissage de chenal près du Quicksand Creek et des dépôts organo-minéraux qui couvrent 4 terrasses de la vallée de la Coppermine dans la zone de la rivière White Sandy livre une évolution de l'environnement végétal depuis 8400 ans. L'étude interprète les résultats en terme de modification climatiques et géomorphologiques.

781. LICHTI-FEDEROVICH, S., Geol. Surv. Can.:
Diatom analysis and paleoecological studies of Quaternary sediments, 1972-.

See:

Diatoms from the southern Beaufort Sea; Geol. Surv. Can., Paper 83-1B, p. 267-271, 1983.

Investigation of diatoms found in surface snow from the Sydkep Ice Cap, Ellesmere Island, District of Franklin; Geol. Surv. Can., Paper 84-1A, p. 287-301, 1984.

782. MCGREGOR, D.C., Geol. Surv. Can.:
Silurian and Devonian spores of Canada, 1975-.

783. MCINTYRE, D.J., Geol. Surv. Can.:
Upper Mesozoic and Cenozoic palynology of western and northern Canada, 1982-.

784. MICHOUX, D., ACHAB, A., INRS-Géoressources:
Mesozoic palynology of eastern Canada offshore.

785. MOTT, R.J., Geol. Surv. Can.:
Quaternary palynology, 1969-.

786. SARJEANT, W.A.S., KENNEDY, J.E., DELAIR, J.B., Univ. Saskatchewan (Geological Sciences):
Supplement to the bibliography of works on the history of geology, 1980-85.

See:

Joseph B. Reade (1801-1870) and the earliest studies of fossil dinoflagellate cysts in England; Micropalaeontol., vol. 1, p. 85-93, 1983.

"Earthquakes in the air"; the seismologial theory of John W. Flamsteed (1693); J. Roy. Astronomical Soc. Can., vol. 76, no. 4, p. 213-223, 1983.

Pathfinder in Palynology: Alfred Eisenack (1891-1982); Micropaleontol., vol. 29, no. 4, p. 470-477, 1983.

Preparation of the Supplement to **Geologists and the History of Geology: An International Bibliography from the Origins to 1978** has been continued. This has involved research in the Geological Survey of Canada Library in Ottawa. Work on Pentland's correspondence is continuing in association with J.B. Delair and J.E. Kennedy; particular attention is being paid to Pentland's correspondence with J.D. Forbes.

787. SARJEANT, W.A.S., WALL, D.A., FENSOME, R.A., WHEELER, J.W., COYNE, C.A., MEHROTRA, N.C., SHARMA, J., Univ. Saskatchewan (Geological Sciences):

Studies of European type material of dinoflagellate cysts from the Jurassic, Cretaceous and Tertiary of Europe and western North America, and of dinoflagellate cyst ecology in Recent sediments, 1980-85.

See:

The dinoflagellate cysts of the **Gonyaulacysta** group: a morphological and taxonomic restudy; AASP Contr. Ser., no. 9, 1983 p.

Dinoflagellate cyst terminology: a discusison and proposals; Can. J. Botany, vol. 60, no. 6, p. 922-943, 1983.

Dinoflagellate cysts from the Middle and Upper Oligocene of Tonisberg (Niederrheingebiet): a morphological and taxonomic restudy; Nova Hedwigia, vol. 35, p. 313-356, 1983.

Restudy of some smaller dinoflagellate cysts from the Upper Cretaceous of Belgium; Ann. Soc. Géol. Belg., vol. 106, p. 1-17, 1983.

Present taxonomic attributions of the dinoflagellate cysts and acritarchs treated by Davey, Downie, Sarjeant and Williams (1966, 1969); Bull. British Mus. (Nat. Hist)., Appendix II to Suppl. 3, p. 25-54, 1983.

A restudy of some dinoflagellate cyst holotypes in the University of Kiel collections IV. The Oligocene and Miocene holotypes of Dorothea Maier (1959); Meyniana, vol. 35, p. 85-137, 1983.

The Jurassic dinoflagellate genera Wanaea and Energlynia: their morphology and evolution; N. Jb. Geol. Palaont. Abh., vol. 161, no. 1, p. 47-61, 1983.

The occurrence of obturacula in microforaminifera; Rev. Palaeobot. Palynol., vol. 38, no. 1-2, p. 91-97, 1983.

During the past year, the redescription of type material from European late Mesozoic and Tertiary localities has continued to be a prime concern for me. Restudies of the late Jurassic type material of Karl Klement, the Middle Cretaceous (Aptian) type material of Alfred Eisenack, the Palaeocene type material of Walter Wetzel and the Oligocene-Miocene type material of Ellen Gerlach, all from Germany, have been sent to press.

R.A. Fensome successfully presented his Ph.D. thesis on "Miospores from the Jurassic-Cretaceous Boundary Beds, Aklavik Range, Northwest Territories, Canada" and J.W. Wheeler his M.Sc. thesis on "Jurassic and Cretaceous Microplankton from the Central Alborz Mountains, Iran". Papers by both students have been published during this year (see list) and other are in press or in preparation. Duncan Wall has revised for publication Martin Bradford's studies of dinoflagellate cyst ecology in the Persian Gulf and Arabian sea; his own work on assemblages from Recent sediments of the Gulf of California and Gulf of Santa Barbara, is nearing completion. Carmel A. Coyne has commenced a study of dinoflagellate assemblages within marine sediments of Mid. Cretaceous age.

Joint work has also been undertaken with Dr. N.C. Mehrotra and Mrs. J. Sharma on Indian Mesozoic assemblages.

788. SINGH, C., Alberta Research Council (Geol. Surv.):

Cenomanian microfloras of the Peace River area, northwestern Alberta, 1969-83.

See:

Alberta Research Council, Bull. 44, 1983.

789. SINGH, C., Alberta Research Council (Geol. Surv.):

Palynological study of the coal-bearing Late Cretaceous-Paleocene strata in the Red Deer river valley, Alberta, 1973-87.

790. SINGH, C., Alberta Research Council (Geol. Surv.):

Palynological study of the Lower Cretaceous oil sands deposits of Alberta, 1983-87.

See:

Sedimentological, ichnological, and palynological evidence for marine shoreline sedimentation, Upper Mannville, east central Alberta; in Sedimentology of Selected Mesozoic Clastic Sequences, Can. Soc. Petrol. Geol., p. 133-137, 1983.

To synthesize the available results of palynological and sedimentological studies of the oil sands deposits in the Peace River, Wabasca, Athabasca, Cold Lake, Lloydminster, and Suffield areas, in order to broadly outline the marine and nomarine facies, correlation, and the depositional setting of the oil sands deposits on a regional basis.

791. SWEET, A.R., Geol. Surv. Can.:

Palynological studies of Mesozoic and Tertiary coal measures in western and northern Canada, 1971-.

792. SWEET, A.R., Geol. Surv. Can.:

Taxonomy and biostratigraphic distribution of Mesozoic and Paleogene megaspores, 1977-.

793. UTTING, J., Geol. Surv. Can.:

Palynology of Carboniferous, Permian and Triassic rocks of northern and western Canada, 1981-.

794. VINCENT, E.E., BASINGER, J.F., Univ. Saskatchewan (Geological Sciences):

Paleocene plants of the Ravenscrag Formation, southern Saskatchewan, 1982-87; Ph.D. thesis (Vincent).

An abundance of fossil plants is preserved in the Paleocene Ravenscrag Formation of southern Saskatchewan. Coal-bearing rocks of the Ravenscrag Formation are widely exposed in southern Saskatchewan, and in the Cypress Hills area extensive exposures make possible collection of numerous florules each representing individual plant associations or communities. Exceptionally well preserved remains of cedars, **Cupressinocladus**, are contributing to a better understanding of diversity and evolution within the Cupressaceae. **Metasequoia** and **Glyptostrobus**, the principal coal forming plants of the North American temperate regions of the Paleocene, are abundant. Aquatic plants such as **Azolla**, **Trapa**, and **Nelumbites** occur in association. Several distinct forest assemblages and fern communites are recognizable. These fossils are providing insights into Paleocene community structure that will help us to interpret isolated floras such as occur commonly throughout southern Saskatchewan and Alberta. The Ravenscrag flora is also important to our understanding of early development of the temperate flora of North America.

795. ZODROW, E.L., Univ. College of Cape Breton (Geology):

Biostratigraphy of Mabou Mines coalfield, Nova Scotia, 1981-84.

The floras and the faunas at Mabou Mines are not diversified. The floras comprise mainly medullosean ferns and the fauna is characterized by **Anthraconauta phillipsii** (Williamson) and **Carbonita** spp. Although correlation is difficult, on floral comparison the Mabou Mines Section is phyto-stratigraphically equivalent to comprise the **Lonchopteris**/lower **Linopteris obliqua** floral Zones of the Morien Group (Pictou Group). In European correlation, this would correspond to middle Westphalian C and lower D ages. Correlation of the fauna with well-established British Chronozones is not without difficulty and a phillipsii Chronozone assignment is proposed which is somewhat lower (Westphalian C) than the floral age.

796. ZODROW, E.L., Univ. College of Cape Breton (Geology):

Stephanian sphenophylls at Point Aconi, Sydney coalfield, Nova Scotia, 1983-84.

Sphenophyll material recently collected from the Point Aconi strata (top, Morien Group of Sydney coalfield, Nova Scotia), shows the presence of at least two form species not previously reported from the Canadian Upper Carboniferous and they include: **Sphenophyllum costae** Sterzel and **S. marsiliaefolium** (von Sternberg) Batenburg. The presence of **S. oblongifolium** is confirmed. The presence of these species support a Stephanian aspect at Point Aconi, and the fructification assocaited with some of the specimens allows a new insight in the heterophyllous nature of the some of the species.

EXPERIMENTAL/EXPÉRIMENTAL

797. ENGI, M., EVANS, B.W., Univ. British Columbia (Geological Sciences):
Stability of minnesotaite, grunnerite, greenalite and phase relations in metamorphic iron formations, 1982-84.

Work on minnesotaite complete. Experiments on GRU + FAY + QTZ + H_2O near completion. Theoretical analysis (thermodynamics, phase relations, solution behaviour) in progress.

798. MCPHAIL, D.C., GREENWOOD, H.J., BROWN, T.H., MEAGHER, E.P., Univ. British Columbia (Geological Sciences):
Stability of magnesian chlorites, 1983-84; M.Sc. thesis (McPhail).

Aim: to bracket the breakdown reactions Chl = Cord + Fo + Sp + H_2O; also bracket the reaction Cord + Fo = En + Sp. Special attention to Al-content of Mg-chlorites, H_2O content of Cord, Al-content of Enstatite, and possible order/disorder in Spinel and Cordierite.

Progress: Synthesis almost complete for all starting materials bracket @ 2kb, ~720°C; experiments under way for reaction @ 1kb, 1.5 kb, (.5 kb); and for reaction 2@ 800°C, 2-4 kb.

IGNEOUS/ROCHES IGNÉES

799. ADAIR, R.N., BURWASH, R.A., Univ. Alberta (Geology):
Stratigraphy and petrology of the Crowsnest pyroclastics, Alberta, 1983-85; M.Sc. thesis (Adair).

Using the section (type section) exposed on highway no. 3, just west of Coleman, Alberta, the following disciplines will be used in a study of the extrusive, pyroclastic components of the Crowsnest formation: Igneous Petrology – thin sections, geochemistry, XRD, SEM (clays); Stratigraphy – lithological variation and correlation (outcrop, well logs), sedimentary, pyroclastic features, palinspastic reconstruction, paleogeographical extent. To date, a full sampling and initial mapping program has been carried out.

800. ANDERSON, A.J., CERNY, P., Univ. Manitoba (Earth Sciences):
The Cross Lake pegmatite field, Manitoba, 1982-84; M.Sc. thesis (Anderson).

See:

Leucogranites and pegmatites in the Cross Lake area, Manitoba; Univ. Manitoba Center for Precambrian Studies, Ann. Rept. 1982, p. 100-108, 1983.

Regional zoning, pegmatite distribution and probable genetic links between pegmatites and granites were established in the Cross Lake field. Two mineralized pegmatite groups are characterized by Be, Li, Rb, Cs, Ta (Sn) enrichment in one case and Be (Cs) Ta (P) enrichment in the other.

801. BACHINSKI, S.W., BACHINSKI, D.J., Univ. New Brunswick (Geology):
Lamprophyres associated with the Lake George antimony deposit, New Brunswick, 1980-84.

802. BARAGAR, W.R.A., Geol. Surv. Can.:
Stratigraphy and petrology of the Natkusiak Basalts, Victoria Island, District of Franklin, 1975-.

803. BARR, S.M., MACDONALD, A.S., Acadia Univ. (Geology):
Granitoid plutons and associated mineral deposits, Cape Breton Island, Nova Scotia, 1978-88.

Granitoid and associated basement and/or volcanic rocks in Cape Breton Island are being mapped (scale 1:20 000) and sampled for petrological studies. Subsequent investigations include geochemistry, age dating, and studies of associated mineral occurrences.

804. BÉDARD, J., Québec Ministère Énergie et Ressources:
Intrusions mineures de la Gaspésie, 1983-84.

Tentative de classifier les intrusions mineures de la Gaspésie par pétrologie, âge, contexte structural, etc.

805. BÉLANGER, J.R., LAURENT, R., Univ. Laval (Géologie):
Etude des roches volcaniques du Siluro-Dévonien de la Baie des Chaleurs, Gaspésie, Québec, 1980-85.

Le projet est en phase terminale, compilation des résultats et préparation des cartes.

806. BOURNE, J.H., Univ. Québec à Montréal (Sciences de la Terre):
Pétrologie des granites de l'Estrie, Québec, 1983-86.

Mapping, petrology and geochemistry of two of the five granites to be studied is well advanced. (Lac aux Araignées and Scotstown). The remaining three (Aylmer, Winslow and Megantic) will be studied this summer. A report summarizing the geology of all five is planned for May 1985.

807. CERNY, P., FRYER B.J., LONGSTAFFE, F.J., TAMMEMAJI, H., Univ. Manitoba (Earth Sciences):
The Lac du Bonnet Batholith, southeastern Manitoba, 1976-86.

Geochemical modelling of classic trace elements, stable isotope and Rb/Sr isotopic data, and REE contents are in progress to characterize the origin of five major units of the batholith.

808. CURRIE, K.L., Geol. Surv. Can.:
Alkaline rocks in Canada, 1968-.

See:

An interim report on the geology and petrology of the Mont Saint Hilaire pluton, Quebec; Geol. Surv. Can., Paper 83-1B, p. 39-46, 1983.

809. CURRIE, K.L., Geol. Surv. Can.:
Granite studies in the Appalachians, 1973-.

See:

Peralkaline granite near Hare Hill, south of Grand Lake, Newfoundland; Geol. Surv. Can., Paper 84-1A, p. 181-184, 1984.

A reconsideration of some geological relations near Saint John, New Brunswick; ibid., p. 193-201, 1984.

810. DANIS, D., BOURNE, J.H., Univ. Québec à Montréal (Sciences de la Terre), Québec Ministère Énergie et Ressources:
Amas granitiques de l'Estrie, Québec, 1983-86.

Etude complétée sur les amas du Lac aux Araignées de la Scotstown.

811. DAVIDSON, A., Geol. Surv. Can.:
Granite studies in the Ennadai-Rankin Inlet region, District of Keewatin, 1966-.

812. DAVIDSON, A., Geol. Surv. Can.:
Granite studies in the Slave Province, District of Mackenzie, 1971-.

813. EMSLIE, R.F., Geol. Surv. Can.:
Geology, petrology and economic potential of the anorthosite suite in southern Labrador, 1975-.

See:

The Mealy dykes, Labrador: petrology, age and tectonic significance; Can. J. Earth Sci., vol. 21, no. 4, p. 437-446, 1984.

814. EMSLIE, R.F., Geol. Surv. Can.:
Petrology, mineralogy, geochemistry and mineral potential of a Helikian non-organic granitic suite in central Labrador and adjacent Quebec, 1979-.

815. FRANCIS, D.M., LUDDEN, J.N., EICHE, G., McGill Univ. (Geological Sciences):
Recent volcanism in the Yukon and northern British Columbia, 1983-86; M.Sc. thesis (Eiche).

Our goal is to document Tertiary to Recent volcanism along the transition from the compressional tectonic environment of the Alaskan Peninsula to the transpressional environment of the northern Canadian Cordillera. We will do this in a three year project designed to measure chemical-stratigraphic sections of the volcanic successions of the following series of mid-Tertiary to Recent eruption centers running across the Yukon and into northern British Columbia:

Wolverine Creek, Nines Creek, Alsek River } Kluane Province, St. Clare Group.

Fort Selkirk, Allegator Lake, Mount Edziza } Alkaline Province.

816. GARCIA, E., CLARK, A.H., PEARCE, T.H., Queen's Univ. (Geological Sciences):
Comparative petrographic study of andesites from the Peruvian Andes and the Cascades, 1982-84; M.Sc. thesis (Garcia).

A detailed study of the petrography of andesites from different localities. A major aim of this study is to determine the extent to which the early history of magmatic events is recorded in petrographic features of the phenocryst assemblages.

Progress to date includes: thin section petrography, major element analyses (XRF), ferrous/ferric determinations, electron microprobes analyses and some trace element analyses from a suite of Peruvian andesites.

817. GIRARD, P., Québec Ministère Énergie et Ressources:
Études pétrographiques et géochimiques des porphyres acides de la Gaspésie nord-central, Québec, 1983-84.

Étude de la nature des felsites de la Gaspésie nord-central.

818. HOGARTH, D.D., SOLBERG, T.N., LOOP, J., PRIDE, C., Univ. Ottawa (Geology):
Carbonatites and associated rocks, Templeton Township, Quebec, 1976-.

Proterozoic carbonatites of Templeton Township are of two types: (1) Primary with lanthanides in fluorapatite and monazite; (2) Hydrothermally reworked with lanthanides principally in fluocarbonates. During hydrothermal activity the bulk lanthanide content is increased 2- to 5-fold, light lanthanide selectivity is increased, and positive Gd anomalies become evident. After hydrothermal alteration, associated fenites show similar trends.

Further work will involve mineral and rock analyses in order to determine a model of origin involving PTX variations in space and time.

819. HULBERT, L.J., COLEMAN, L.C., KYSER, T.K., Univ. Saskatchewan (Geological Sciences):
Controls on sulfide and PGE mineralization in the Poosietevsvus Limb of the Bushveld Complex, R.S.A., 1983-84.

To investigate the main and upper zone of the Bushveld Complex north of Poosietevsvus. This investigation would serve as the petrological back up necessary to interpret Platinum-Group-Element concentrations and ratios within an extremely differentiated sequence of cumulates. This same sequence of rocks was also investigated with respect to the isotopic composition of the sulfur that makes up the sulfides and the PGE present within.

Once the petrological investigation is finished in June/84 this portion of the Bushveld Complex will represent one of the most extensively studied layered intrusions in the world and the best documented with respect to the behaviour of PGE's and the isotopic composition of sulfur within a well differentiated layered intrusion.

820. LAFLEUR, J., HOGARTH, D.D., Univ. Ottawa (Geology):
Petrology and origin of the Round Lake batholith, Kirkland Lake area, Ontario, 1982-84; M.Sc. thesis (Lafleur).

821. LAMBERT, M.B., Geol. Surv. Can.:
Archean volcanic studies in the Slave-Bear Province, District of Mackenzie, 1973-.

822. LAMBERT, M.B., Geol. Surv. Can.:
Archean felsic volcanic complex near Regan Lake, District of Mackenzie, Northwest Territories, 1974-.

823. LAMBERT, R.St.J., CHAMBERLAIN, V.E., CUNNINGHAM, M., Univ. Alberta (Geology):
Geochronology and petrogenesis of Yellowknife Volcanics, Northwest Territories, 1978-84; M.Sc. thesis (Cunningham).

The Kam Formation, 2660 Ma old by Sm-Nd dating, is an iron-rich tholeiite intracontinental sequence. The Banting Formation (same age) is a calc-alkali sequence, as is the Duck Formation, which has been downdated to c. 2000 Ma. The Giant shear zone is 2510 Ma (Rb-Sr), the same age as the Prosperous Lake granite and Sr re-setting of the Banting Formation.

824. LAMBERT, R.St.J., CHAMBERLAIN, V.E., HOLLAND, J.G., Univ. Alberta (Geology):
Petrogenesis of Columbia River Basalts, Oregon and Washington, 1983-85.

Pb isotope studies show that the units east of the Blue Mountains have more radiogenic Pb than any other unit, while the Saddle Mountain Group has the least radiogenic Pb. The variations do not correlate with Nd or Sr isotopes. Crustal contamination appears to have played only a minor, though observable role in the petrogenesis of these basalts.

825. MEINTZER, R.E., CERNY, P., Univ. Manitoba (Earth Sciences):
Geochemistry and petrology of the Yellowknife pegmatite field, Northwest Territories, 1980-87; PH.D. thesis (Meintzer).

See:

Petrology of granitoids and pegmatites of the Yellowknife pegmatite field, N.W.T.; Univ. Manitoba Centre for Precambrian Studies, Ann. Rept. 1982, p. 91-96, 1983.

Field work has been finished on the pegmatites, leucogranites and batholithic granitoids of the Yellowknife pegmatite field. Collecting of geochemical and mineralogical data is in progress.

826. NADEAU, S.N., FRANCIS, D.M., McGill Univ. (Geological Sciences):
Metasomatism process of the upper mantle and relationship to magma generation; a volatile phases study, 1983-86; PH.D. thesis (Nadeau).

This Ph.D. project investigates the compositions of fluid inclusions occuring in ultramafic xenoliths from the upper mantle. The xenoliths samples to be studied have been selected from areas where mantle metasomatism has been documented; including, Nunivak Island (Alaska), the East African Rift (Africa), Arizona (Western United States), Victoria (Australia), Massif Central (France) and Dreiser Weiher (Germany). The analytical techniques to be used include Raman Spectroscopy, Microthermometry and Mass Spectrometry. The purpose of this project is to define the volatiles species which are present in the upper mantle. A comparison of fluid inclusions from a variety of magmatic associations could provide constraints for the physiochemical processes involved in magma genesis in the upper mantle.

827. NICHOLLS, J., STOUT, M.Z., Univ. Calgary (Geology and Geophysics):
Comparison of nephelinite lavas from oceanic and continental volcanic centres, 1980-85.

Electron microprobe analyses of minerals is nearly completed and chemical analysis of whole rock is continuing on ultramafic and alkalic lavas from the Canary Islands, Hawaiian Islands and British Columbia.

828. NISBET, E.G., CRAIG, L.O., Univ. Saskatchewan (Geological Sciences):
Geology of Pelican Narrows, Saskatchewan, 1983-; M.Sc. thesis (Craig).

829. NISBET, E.G., FOWLER, C.M.R., Univ. Saskatchewan (Geological Sciences):
Evolution of Williston Basin, 1983-.

830. NISBET, E.G., JANSSER, B., Univ. Saskatchewan (Geological Sciences):
Geology of Star Lake, Saskatchewan, 1983-.

831. NISBET, E.G., KYSER, T.K., Univ. Saskatchewan (Geological Sciences):
Stable isotopes in komatiites, 1983-.

832. NISBET, E.G., WILKS, M., Univ. Saskatchewan (Geological Sciences):
Geology of Steep Rock Lake, Ontario, 1983-; M.Sc. thesis (Wilks).

833. PEARCE, T.H., Queen's Univ. (Geological Sciences):
Comparative petrology of volcanic and related rocks, 1984-87.

The technique of comparative petrology already developed by the author (and others) for basic rocks will be extended to rocks of intermediate composition.

It is expected that petrographic distinction of rocks from different tectonic environments will be of direct benefit to both theoretical studies and practical applications such as exploration strategy based on tectonics.

834. RIVARD, B.R., FRANCIS, D.M., McGill Univ. (Geological Sciences):
Processes operative in an Archean magma chamber, 1983-85; M.Sc. thesis (Rivard).

An ultramafic pile of cumulate horizons after olivine-chromite is exposed at the base of the Yasinski segment of the La Grande greenstone belt. It is underlain by a system of crosscutting gabbroic dykes and overlain by a suite of mafic lavas. The lavas and gabbros evolved along very different liquid lines of descent. The gabbros display an iron enrichment while the lavas yield an iron depletion trend. The least evolved lavas, of each of the three lavas suites discussed, overlap the gabbroic compositional field in iron magnesium space. Fractional crystallization models do not reproduce the observed lavas trends. The best fit is obtained by modeling equilibrium crystallization of olivine. The model proposes a genetic relationship between the lavas suites and the gabbros observed beneath the cumulate pile.

835. ROGERS, H.D., BARR, S.M., Acadia Univ. (Geology):
Granitoid plutonism in the Shelburne metamorphic-igneous complex, Nova Scotia, 1983-85; M.Sc. thesis (Rogers).

See:

Geology of the igenous-metamorphic complex of Shelburne and eastern Yarmouth counties, Nova Scotia; Geol. Surv. Can., Paper 84-1A, p. 463-465, 1984.

Field work completed in 1983 in Shelburne and adjacent parts of Yarmouth counties indicates that the granitoid intrusions in the western part of the area are part of a single tonalite pluton (Barrington Passage pluton). This pluton is separated from the Shelburne Pluton to the east by a 2 km wide septum of metasedimentary rocks. The Shelburne Pluton consists of granite, granodiorite and trondhjemite. In the northern part of the area the Bald Mountain pluton consists of granite. Several small bodies of diabase, diorite, granodiorite and tonalite are scattered throughout the area. All of the granitoid rocks display a pervasive foliation of apparent syntectonic origin in spite of K-Ar biotite ages of 302 to 308 Ma previously reported. The structural grain is parallel to that of the surrounding metamorphic rocks. Mapping will be completed in 1984, and petrographic and geochemical analysis will continue into 1985.

836. SCHAU, M., Geol. Surv. Can.:
Volcanic rocks of the Prince Albert belt, Districts of Franklin and Keewatin, 1972-.

837. SCOTT, S.D., CHASE, R.L., BARRETT, T.J., Univ. Toronto (Geology), Univ. British Columbia (Geological Sciences):
Young seamounts of the northeast Pacific Ocean, 1983-86.

838. SEXTON, A.J., BARR, S.M., Acadia Univ. (Geology):
Geology and petrogenesis of the Sporting Mountain Pluton, Cape Breton Island, Nova Scotia, 1983-85; M.Sc. thesis (Sexton).

Mapping will cover areas of granitoid and volcanic rocks of inferred Late Precambrian age in the region between St. Peters north to the West Bay, Bras D'or Lake area. Subsequent petrological and geochemical studies will focus on the granitoid rocks to clarify their ages, genetic relationships, petrogenesis and possible relationship to Cu deposits in the area.

839. SOLES, J.A., EMR (CANMET):
Underground nuclear waste repository, 1977-86.

Detailed petrographic analysis is an essential step in the evaluation of the significance of measurements of the thermophysical properties of rocks at possible repository sites.

840. VOS, M.A., COLVINE, A.C., Ontario Geol. Surv.:
Petrology of some alkalic granites (alaskites) in Ontario, 1984-85.

A preliminary survey of selected alkali granites in Ontario should indicate an economic potential, if any, for production of feldspar, quartz and mica from this source. Careful analysis of mineral separation processes, e.g., flotation, and of chemical purity of different (size) fractions of the crushed sample material is envisaged.

841. WHITTAKER, P.J., WATKINSON, D.H., Carleton Univ. (Geology):
Geology and petrogenesis of chromite and chrome-spinel in Alpine-type peridotites of the Cache Creek Group, British Columbia, 1979-83; PH.D. thesis (Whittaker).

See:

Geology and alteration characteristics of Cr-spinel in dunite at Mt. Sydney-Williams, central British Columbia; Geol. Surv. Can., Paper 83-1B, p. 177-184, 1983.

Alpine-type peridotites in Permian aged Cache Creek Group metasedimentary rocks are upper mantle parts of a dismembered ophiolite succession. Tectonism during the latest Triassic or earliest Jurassic emplaced alpine-type periodites which were further dissected and displaced by strike-slip faulting during the late Cretaceous or early Tertiary.

Fault bounded alpine-type periodites from southern to central B.C. consists predominantly of harzburgite with lesser amounts of dunite and minor orthopyroxenite. These units all contain a penetrative foliation of mantle origin defined by elongate orthopyroxene porphyroclasts and elongate patches of finely recrystallized olivine neoblasts. Mylonitic textures and en echelon breccia zones also reflect mantle origins.

Chromite, chromitite and Cr-spinel occur in harzburgite and dunite in alpine-type complexes with chromitite also forming a dyke-like intrusion in metacarbonate rocks of the Anarchist Series in southern B.C.. Chromite forms a disseminated accessory phase throughout harzburgite and dunite and accumulations of chromitite are sparsely distributed. Chromitite forms podiform and layered strucutres which are deformed by mantle shearing. Chromitite has various textures which include massive, highly disseminated, and nodular. In chromitite from harzburgite a thin dunitic selvage may be present. Many occurrences, however, are in contact with harzburgite. Cr-spinel is most common from dunite layers and is usually associated with a chlorite-serpentine alteration rim. In dunite layers Cr-spinel form centrally concordant narrow and highly disseminated seams, rarely with some chromite. Cr-spinel with alteration rims changes outwards from Cr-spinel to Cr-magnetite, ferritchromite and magnetite.

Chromite from podiform and layered chromitite occurrences carries fluid and solid inclusions unaltered by serpentinization. Fluids form pseudo-secondary inclusion trains, patches and swarms with isolated primary fluid inclusion rarely observed. Solid inclusions are mostly olivine with minor chlorite and pargasitic-amphiboie. Platinum group minerals (laurite) occur in layered and podiform chromitite.

Field relationships and chromite compositions suggest a magma or partial melt related origin for the "Normal" chromite of layered and podiform chromitites. High Al^{+3} Cr-spinel which is confined to occurrences as thin seams in dunite layers is attributed to a solution related origin.

842. WILSON, C., LUDDEN, J., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Volcanites cambro-ordoviciennes, 1983-85; M.Sc. (Wilson).

Étude pétrologique des volcanites du cambro-ordovicien de la Gaspésie.

METAMORPHIC/ROCHES MÉTAMORPHIQUES

843. BEAKHOUSE, G.P., Ontario Geol. Surv.:
High metamorphic grade and migmatitic volcanic sequences in the Superior Province, northwestern Ontario, 1983-86.

To evaluate the extent and distribution of "ghost greenstone stratigraphy" in granitoid complexes of the Superior Province. Emphasis is placed on developing criteria to aid in the identification of migmatitic supracrustal rocks.

844. DRESSLER, B.O., Ontario Geol. Surv.:
The footwall and the sublayer of the Sudbury Structure, Ontario, 1979-84.

See:

Breccias in the footwall of the Sudbury impact structure-terrestrial equivalents of lunar breccias; Abstracts, Lunar and Planetary Sciences Conf., vol. XIV, p. 167, 168, 1983.

Contamination and genesis of Sudbury ores; Ontario Geol. Surv., Misc. Paper 113, 1983.

Field work and most laboratory investigations are completed. Results are being written up.

845. FRASER, J.A., Geol. Surv. Can.:
Metamorphism in the Canadian Shield, 1974-.

846. FROESE, E., Geol. Surv. Can.:
A survey of metamorphism in the Canadian Shield, 1978-.

847. FROESE, E., Geol. Surv. Can.:
Metamorphism in the Kisseynew Subprovince, 1980-.

848. GHENT, E.D., STOUT, M.Z., Univ. Calgary (Geology and Geophysics):
Petrologic and geochemical studies of metamorphism, 1982-.

See:

Plagioclase-clinopyroxene-garnet-quartz equilibria and the geobarometry and geothemometry of garnet amphibolites from Mica Creek, British Columbia; Can. J. Earth Sci., vol. 20, p. 699-706, 1983.

A study of regional metamorphism in the Mica Creek area and in the Blue River area, British Columbia, is continuing. Ghent and Stout are continuing to develop and test new geobarometers and geothermometers. Recently we have emphasized work on metabasites and have used garnet-clinopyroxene geothermometry and garnet-clinopyroxene-plagioclase-quartz geobarometry. A recent paper on the use of TiO_2 activity and its application to geobarometry has recently been accepted for publication. Work on mixed volatile equilibria, including fluid inclusion studies, is also in progress. We have also initiated a study of low-pressure metamorphism near Mt. Atna, British Columbia, with G. Woodsworth, Geological Survey of Canada.

849. GORDON, T.M., Geol. Surv. Can.:
Metamorphism of volcanic rocks, Crowduck Bay, Manitoba, 1980-.

See:

Metamorphic process in the Kisseynew sedimentary gneiss belt. I. Initial stages of migmatite formation in the Noble Lake area, Manitoba; Geol. Surv. Can., Paper 84-1A, p. 307-312, 1984.

850. GORDON, T.M., Geol. Surv. Can.:
Metamorphic processes in the Kisseynew sedimentary gneiss belt, Manitoba, 1983-.

See:

Metamorphic processes in the Kisseynew sedimentary geniss belt. I. Initial stages of migmatite formation in the Noble Lake area, Manitoba; Geol. Surv. Can., Paper 84-1A, p. 307-312, 1984.

851. OWEN, J., RIVERS, T., GOWER, C.F., Memorial Univ. (Earth Sciences):
Geological and geochronological investigations in the Grenville Front region, coast of Labrador, 1982-85; Ph.D. thesis (Owers).

852. RAESIDE, R.P., ROGERS, H.D., BARR, S.M., Acadia Univ. (Geology):
Shelburne metamorphic complex mapping project, Nova Scotia, 1983-88.

The Shelburne metamorphic complex of southwestern Nova Scotia presents us with the higest metamorphic grade rocks and presumably deepest levels of erosion of the Meguma Zone of the Appalachian Orogen. Elements of the Goldenville and Halifax Formations have been identified, but the complexities introduced by the metamorphism and abundant granitoid intrusions make direct stratigraphic correlations difficult. The long term aims of this project are to systematically map the metamorphic culmination and define the isograds, deformation style and ultimately the stratigraphic succession of the complex.

Mapping has begun in the northern and interior parts of the complex. The outlines of the major plutons have been defined and the distribution of some indicator metamorphic minerals established. A chemically distinctive Mn-rich unit has been identified which may be suitable as a marker horizon in the otherwise montonous pelitlc and semipelitic rock mass.

853. RIVERS, T., Memorial Univ. (Earth Sciences):
Proterozoic investigations in the Grenville Province of western Labrador, Newfoundland, 1977-.

See:

Progressive metamorphism of pelitic and quartzofeldspathic rocks in the Grenville Province of western Labrador-tectonic implications of bathozone 6 assemblages; Can. J. Earth Sci., vol. 20, p. 1791-1804, 1983.

The northern margin of the Grenville Province in western Labrador-anatomy of an ancient orogenic front; Precamb. Res., vol. 22, p. 41-73, 1983.

854. SCHANDL, E.S., WICKS, F.J., Univ. Toronto (Geology), Royal Ontario Mus. (Mineralogy and Geology):
Alteration of ultramafic rocks in the Kidd volcanic complex of the Abitibi greenstone belt, Ontario, Canada, 1983-87; Ph.D. thesis (Schandl).

The ultramafic rocks in the vicinity of Timmins, Ontario show pervasive alterations, particularly to talc and carbonate. A detailed study of the mineralogy of the alteration products, the major and trace element geochemistry of whole rocks and fluid inclusion and stable isotope studies will lead to a better understanding of the nature and origin of the metasomatising fluids responsible for the alteration. A model will be developed for the interpretation of geochemical data to distinguish between alterations associated with possible mineralization and diagenetic, contact and regional alterations.

855. TURNOCK, A.C., Univ. Manitoba (Earth Sciences):
Garnet-rich metamorphosed sediments in volcanic and clastic rocks, 1982-84.

An area of about 1/2 sq. kilometre has been mapped at 1 = 5000, and it is seen that garnet-rich rocks, which are the metamorphic (staurolite grade) products of Fe-Al material, probably chlorite, occur in sedimentary formations and in fractures and posds in a felsite dome. Granoblastites rich in garnet (up to 80%) with cummingtonite and hornblende, occur in beds 4-30 cm thick, interpreted to have formed as chemical precipitate ironstone. These are interbedded in conglomerates, which have felsite fragments in a mafic matrix rich in garnet, cummingtonite, hornblende, interpreted to have formed by mixing of fragments and mud during deposition. There is also a bed of pyrrhotite, a sulfide facies of iron-rich precipitation. These associations link felsic volcanism, clastic sedimentation, and precipitation of Fe and S from a presumed hydrothermal system.

856. VAN NOSTRAND, T., RIVERS, T., GOWER, C.F., Memorial Univ. (Earth Sciences):
A structural metamorphic and gravimetric study of the boundary between the Groswater Bay and Lake Melville Terranes, eastern Labrador, 1984-86.

To delineate the tectonic and metamorphic and lithologic characer of the Groswater Bay and Lake Melville terranes in the Sandwich Bay area of eastern Labrador, with particular attention being payed to the nature of their mutual boundary region. A gravity study of the boundary will also be attempted.

857. WICKS, F.J., Royal Ontario Mus. (Mineralogy and Geology):
Deformation histories as recorded by serpentinites, 1981-85.

See:

Deformation histories as recorded by serpentinites. I. Deformation prior to serpentinization; Can. Mineral., vol. 22, pt. 1, p. 185-195, 1984.

Deformation histories as recorded by serpentinites. II. Deformation during and after serpentinization; ibid., p. 197-203, 1984.

Deformation histories as recorded by serpentinites. III. Fracture patterns developed prior to serpentinization; ibid., p. 205-209, 1984.

The initial studies on the interpretation of serpentine pseudomorphs after plastically deformed olivine, pyroxene and amphibole, and on the deformation of the serpentine minerals themselves have been completed and published. More detailed work is in progress.

858. WICKS, F.J., FALLS, R., Royal Ontario Mus. (Mineralogy and Geology):
Mineralogy and geochemistry of the chrysotile asbestos deposits of the eastern townships, Quebec, 1982-85.

The establishment of the metamorphic grade of each deposit using the serpentine mineralogy, coupled with the harshness of different chrysotile asbestos fibres from each deposit appears to be helping to explain the variation in flexibility of the fibres. Thermoanalyses of different fibres is being carried out to provide more data on the volatile content of the chrysotile asbestos.

859. WICKS, F.J., WAN, Pu, HEDJRAN, K., FALLS, R., OZORAY, J., Univ. Toronto (Geology), Royal Ontario Mus. (Mineralogy and Geology):
Mineralogy and geochemistry of the chrysotile asbestos deposits of Ontario, 1982-85.

See:

Ontario. Geol. Surv., Misc. Paper 113, p. 193-199, 1983.

Detailed mapping of the Munro sill has been carried out in the area of the B pit at the old Munro mine, and at an area 0.5 km east of the Munro mine. In addition the rodingitized volcanics at the north-east contact of the serpentinite at the Reeves mine was mapped. Petrography, mineralogial and geochemical studies on the nature of the host komatiites as well as the serpentinites and chrysotile asbestos are progressing.

SEDIMENTARY/ROCHES SÉDIMENTAIRES

860. IWUAGWU, J.C., LERBEKMO, J.F., Univ. Alberta (Geology):
Depositional and post-depositional analysis of the basal Belly River Formation in southwestern Alberta, 1979-83; Ph.D. thesis (Iwuagwu).

861. MUGRIDGE, S., NOBLE, J.P.A., Univ. New Brunswick (Geology):
Carbonate diagenesis in the Silurian of northern New Brunswick/Gaspé, Quebec, 1982-84; M.Sc. thesis (Mugridge).

862. QUIRT, D.H., HOEVE, J., MELLINGER, M., Saskatchewan Research Council (Geology):
Stratigraphy and lithogeochemistry of the Athabasca Group of northern Saskatchewan, 1982-85.

See:

Clay mineral stratigraphy of the Athabasca Group: correlation inside and outside the Carswell structure; Saskatchewan Research Council, Publ. R745-4-A-83, 1983.

Lithogeochemistry of the Athabasca Group; Saskatchewan Geol. Survey, Misc. Rept. 83-4, 1983.

An investigation into the petrology, clay mineral stratigraphy and lithogeochemistry of the Athabasca Group. Detailed XRD, petrologic and geochemical analyses of 500 sandstone samples is in progress in order to characterize diagenetic mineral assemblages on a formation basis. The relationship between unconformity-type uranium mineralization and its remobilization, and the diagenesis of the Athabasca Group is emphasized.

863. RAWSTHORN, K., HENDRY, H.E., Univ. Saskatchewan (Geological Sciences):
Diagenesis of the Athabasca Sandstone, Saskatchewan, 1982-84; M.Sc. thesis (Rawsthorn).

Rocks from the Rumpel Lake and CSP-2 cores in the Athabasca Formation of northern Saskatchewan are being studied to determine their diagenetic history. Previous studies of these cores at the Saskatchewan Research Council yielded information on clay mineral composition; these are now being complemented by petrographic and SEM work.

864. WILSON, J.A., Alberta Research Council (Geol. Surv.):
Athabasca basin study, northeastern Alberta, 1979-.

Emphasis is now being placed on a study of the crystalline basement and regolith beneath the Athabasca Group. Confidentiality restraints on much of the material has now been lifted and progress towards publication is being made.

865. WING, S.J.C., HENDRY, H.E., Univ. Saskatchewan (Geological Sciences):
Diagenesis of the Upper Cretaceous Frenchman Formation, southern Saskatchewan, 1975-84; M.Sc. thesis (Wing).

The Frenchman Formation (Maestrichtian) of southern Saskatchewan contains several different types of cement. Carbonate-cemented concretions and sandstone ledges have been interpreted as syndepositional non-pedogenic calcrete. Haematite and limonite cements formed by oxidation of pyrite nodules and by oxidation of ferrous iron in clays. Local gypsum cements have formed where sulphate-bearing waters have seeped to the surface in recent times. The distribution of the carbonate cement was controlled primarily by the position of ancient water tables and the distribution of permeable zones in the formation.

GENERAL/GÉNÉRALITÉS

866. ENGI, M., Univ. British Columbia (Geological Sciences):
Thermodynamics of the $FeMg_{-1}$ exchange in minerals, 1982-84.

Analysis of the available Fe-Mg partitioning data (experimental and selected natural) to derive a set of internally consistent solution models for all the common ferro-magnesian mineral solutions.

867. HOEVE, J., Saskatachewan Research Council (Geology):
Soda metasomatism and mineralization at Beaverlodge, northern Saskatchewan, 1982-.

Uranium mineralization at Beaverlodge displays characteristic features of the Na-Ti-U Class of metamorphic hydrothermal deposits. Reconnaissance work to date has established that soda metasomatism at Beaverlodge is much more wide-spread and of much greater importance than previously realized. Objectives are to elucidate the relationships between regional metasomatism and uranium and gold mineralization.

868. HOUDE, R., BERARD, J., École Polytechnique (Génie minéral):
Etude des réactions chimiques entre un calcaire et le ciment Portland, 1981-84; thèse de maîtrise (Houde).

869. PEARCE, T.H., CLARK, A.H., ROEDER, P.L., HELMSTAEDT, H., Queen's Univ. (Geological Sciences):
Laser interferometry, fluorescence and holography: applications in the earth sciences, 1984-87.

To maintain and expand Canadian expertise in the application of advanced laser technology to problems in the earth sciences. Laser interference microscopy will be applied to studies of dispersion in minerals, and zoning in magmatic crystals. From the latter study it is expected that the eruptive history of magmas may be "read" in the complex zoning of phenocrysts LASER FLUORESCENCE, used at present in biochemistry and forensic science (to raise latent fingerprints), has been successfully applied to minerals. It is expected this new technique will help to identify and characterize minerals. HOLOGRAPHY is a basic research tool like photography which it superficialy resembles. It is at about the same stage of development as photography was at the turn of the centruy. Holography has the unique ability to record true 3-dimensional information with great depth of focus and exceptional width of field. It is expected that, under high magnification, details of microstructures and shapes of microlites will be recorded which are unobtainable using ordinary microscopes.

870. THEYER, P., Manitoba Dept. Energy and Mines (Geol. Services Br.):
Gold metallotects in the Rich Lake greenstone belt of Manitoba, 1983-.

871. ANDERSON, T.W., Geol. Surv. Can.:
Quaternary paleoecology, Great lakes, 1978-.

872. ANDRIASHEK, L.D., Alberta Research Council (Geol. Surv.):
Quaternary stratigraphy and surficial geology of the Edmonton map area, NTS 83H, Alberta, 1978-84.

Data compilation essentially completed. Four cross-sections have been drafted throughout the map area. These require reworking and will form basis for the stratigraphic report. A preliminary report is on open file, and shows which major stratigraphic units are present.

873. ANDRIASHEK, L.D., FENTON, M.M., RUTTER, N.W., Alberta Research Council (Geol. Surv.), Univ. Alberta (Geology):
Quaternary stratigraphy of the Sand River map area, NTS 73L, 1976-84; M.Sc. thesis (Andriashek).

See:

Bedrock topography of the Sand River map area (1:250 000 scale map); Alberta Geol. Surv. (ARC), 1983.

Surficial geology of the Sand River map area (1:250 000 scale map); ibid., 1984.

874. BARNETT, P.J., Ontario Geol. Surv.:
Quaternary geology of Renfrew County, Ontario, 1977-85.

875. BARNETT, P.J., Ontario Geol. Surv., Univ. Waterloo (Earth Sciences):
Quaternary geology of the Long Point-Port Burwell area, Ontario, 1982-85; Ph.D. thesis.

Preliminary maps have been published with marginal notes which describe the general geology of the area. Detailed studies into the stratigraphy and sedimentology are continuing and will be incorporated in the geological report for this area.

876. BLAKE, W., Jr., Geol. Surv. Can.:
Quaternary geochronology, Arctic Islands, 1975-.

877. BLASCO, S.M., Geol. Surv. Can.:
Surficial geology and geomorphology, Mackenzie Bay – continental shelf, 1970-.

878. BOBROWSKY, P.T., RUTTER, N.W., Univ. Alberta (Geology):
The Quaternary geologic and paleoenvironmental history of the Finlay River, Rocky Mountain Trench, British Columbia, Canada, 1983-86; Ph.D. thesis (Bobrowsky).

Involves the elucidation of the Quaternary geologic history of the Rocky Mountain Trench along the Finlay River of northeastern British Columbia. Briefly, the purpose of this study is to: 1) define the Quaternary geologic history in the area between 56°55'N to 57°25'N and 124°45'W and 125°39'W using stratigraphic and sedimentologic data from cutbank exposures along the Finlay River; 2) interpret the genesis of glacially derived sediments using several facies models; 3) determine the nature, extent and association of glacial, interglacial and Holocene surficial deposits present in the ara delimited by 56°0'N to 58°0'N and 124°0'W to 127°0'W; and 4) establish the interglacial and interstadial paleoenvironmental conditions of the region through the analysis of recovered gastropod, pollen and macrobotanical remains.

879. BROOKES, I.A., SCOTT, D.B., MCANDREWS, J.H., York Univ. (Geography):
Glacial and sea level history of Newfoundland, 1981-86.

We report on pollen and microfaunal analyses and radiocarbon dates from two cores taken from salt-marsh deposits bordering Port au Port Bay, west Newfoundland. Results show that relative sea-level stood at 2.8 m below present HHWL at 2770 ± 300 years BP and at -1.8 m at 2365 ± 175 years BP at the core site. A previously undiscussed date of 5800 ± 200 years BP on a sea-level at 11-14 m below "sea-level" and higher dated sea levels earlier discussed, are synthesized into a second approximation of post-glacial relative sea-level changes in the local area. This supports a recent model of sea-level response to wastage of a limited Late Wisconsinan ice load in the wider region, which derived from previous sea-level data.

880. BROOKES, I.A., SCOTT, D.B., MCANDREWS, J.H., York Univ. (Geography):
Glaciation of Bonavista Peninsula, northeast Newfoundland: contrasts in weathering and glacial style.

Characterization of postglacial slope modification, weathering, and soil development over Bonavista Peninsula (48.5°N, 55°W) permits recognition of three "weathering zones": an inner zone glaciated in the Late Wisconsinan, an outer zone glaciated probably earlier in the Wisconsinan, and a small extremity showing intense periglaciation but no glacial evidence. Boundarir between zones are related to topographic constraints on extension of former glacial margins.

Mapping of ice-flow directional indicators reveals a contrast in glacial styles between the two glaciated zones. The inner, younger zone was glaciated by the peripheral zone of a Late Wisconsinan ice cap centred over the interior of insular Newfoundland. Northeastward flow to this area was strongly drawn down into deep bays flanking Bonavista Peninsula and deflected by a line of hills bisecting it, thus preventing northeastward extension. The outer, older zone was glaciated by a dynamically independent ice dome in which flow was directed seawards from an axis along the median height of land. This dome was probably contiguous with island-centered ice over the inner part of the peninsula, but evidence for an earlier glaciation there is uncertain and may have been eradicated by the later one. Ice from this dome failed to surmount a small plateau near the extremity of the peninsula, over which autochthonous felsenmeer is ubiquitous to ca. 1.5 m depth, from which erratics have not been recorded, and around which an early glacial limit is marked by a subdued moraine.

It is hypothesized that restriction of glaciation over this boreal, ocean-fringed, upland was due to starvation, itself a result of extensive sea-ice over the NW Atlantic Ocean.

881. CHAUVIN, L., DAVID, P.P., Québec Ministère Énergie et Ressources:
Géologie du Quaternaire et dispersion glaciaire de l'Est de la Gaspésie, Québec, 1982-85.

Voir:

Géologie du Quaternaire et Dispersion glaciaire en Gaspésie Région de Mont-Louis, Rivière Madeleine; Québec Ministère Énergie et Ressources, ET 83-19, 1984.

Géologie du Quaternaire de la région de Ruisseau Lesseps-Murdochville; ibid., DP 83-26, 1984.

Objectifs: Cartographie 1:50 000 des sédiments Quaternaires; étude détaillée de dispersion glaciaire; et étude de l'influence du transport glaciaire sur la géochimie des sédiments de ruisseau. Avancements: 2 saisons de terrain sur 3 de complétées.

882. CLAGUE, J.J., Geol. Surv. Can.:
Quaternary geology, terrain inventory, Prince Rupert-Terrace, Smithers area, British Columbia, 1975-.

883. CLAGUE, J.J., Geol. Surv. Can.:
Quaternary geology, upper Fraser River Basin, British Columbia, 1981-.

See:

Sedimentary environments and postglacial history of the Fraser Delta and lower Fraser Valley, British Columbia; Can. J. Earth Sci., vol. 20, no. 8, p. 1314-1326, 1983.

884. DREDGE, L.A., Geol. Surv. Can.:
Quaternary geology, terrain inventory, northeastern Manitoba, 1975-.

885. DREDGE, L.A., Geol. Surv. Can.:
Quaternary geology – terrain inventory, northwestern Manitoba, 1980-.

See:

Uranium and base metal concentrations in till samples from northern Manitoba; Geol. Surv. Can., Paper 83-1B, p. 303-307, 1983.

886. DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Géologie du Quaternaire de la Côte Nord du Saint-Laurent, 1973-85.

Voir:

Géologie des formations en surface et géomorphologie de la zone côtière de la Moyenne Côte Nord du Saint-Laurent (Québec), avec description de forages; Commission géologique du Canada, Dossier public no. 959, 1983.

Géologie des formations en surface de la Moyenne Côte Nord du Saint-Laurent (Québec); Commission géologique du Canada, Dossier public no. 958, 1983.

Les travaux de terrain sont complétés mises à part quelques vérifications. La cartographie commence à être publiée et un rapport géologique est prévu.

887. DUBOIS, J.M.M., GWYN, Q.H.J., Univ. Sherbrooke (Géographie):
Le Quaternaire d'Anticosti, Québec, 1979-86.

Voir:

Histoire des mouvements de la croûte terrestre depuis 35 000 ans dans le nord du golfe du St-Laurent; Annales de l'ACFAS, vol. 50, p. 126, 1983.

La limite glaciaire dans le golfe du Saint-Laurent au Wisconsinien moyen et tardif; Annales de l'ACFAS, vol. 50, p. 122, 1983.

Late Wisconsinan ice marginal geomorphology and sedimentology in the coastal zone, northern Gulf of St. Lawrence; Geol. Soc. Amer., Abstracts with programs, vol. 15, no. 3, p. 194, 1983.

The development of Late Quaternary lithofacies sequences and their chronological control, Northern Gulf of St. Lawrence; Correlation of Quaternary chronologies Symp., York Univ., Abstracts with program, p. 64-65, 1983.

Classification des environnements géologiques de l'île d'Anticosti: une approche utilisant une simulation du satellite Landsat-4; Annales de l'ACFAS, vol. 50, p. 120, 1983.

Il y a 5 objectifs: 1) cartographie au 1:100 000è de la géomorphologie et des formations meubles; 2) étude de la limite marine maximale; 3) stratigraphie et événements quaternaires; 4) évolution postglaciaire de la zone côtière; 5) étude de l'évolution récente des littoraux. Quatre étés de terrain ont été effectués entre 1980 et 1983 et la cartographie préliminaire de l'île est complétée.

888. DUBOIS, J.M.M., GWYN, Q.H.J., PARENT, M., CLÉMENT, P., Univ. Sherbrooke (Géographie):
Le Quaternaire des Cantons de l'Est, Québec, 1980-87.

Voir:

L'évolution du lac proglaciaire Memphrémagog, sud du Québec; Géographie physique et Quaternaire, vol. 37, no. 2, p. 197-204, 1983.

La déglaciation de la rivière Missisquoi-Nord et la corrélation entre les lacs proglaciaires Memphrémagog et Vermont; Annales de l'ACFAS, vol. 50, p. 121, 1983.

Développement des lacs proglaciaires et déglaciation des hauts-bassins des rivières au Saumon et Chaudière, sud du Québec; Géographie physique et Quaternaire, vol. 37, no. 1, p. 93-105, 1983.

Évolution des lacs proglaciaires et déglaciation de la haute-vallée de la Saint-François, sud du Québec; ibid., p. 84-92, 1983.

La déglaciation du bassin du lac Aylmer, Estrie, Québec; Annales de l'ACFAS, vol. 50, p. 121, 1983.

Le projet vise à compléter la cartographie des dépôts meubles et de la géomorphologie des Cantons de l'Est et à faire une mise au point définitive sur l'histoire du Quaternaire.

889. DYKE, A.S., Geol. Surv. Can.:
Quaternary geology – terrain inventory, Boothia Peninsula, northeast Keewatin, and Somerset and Prince of Wales Islands, District of Franklin, 1975-.

890. DYKE, A.S., Geol. Surv. Can.:
Quaternary geology – terrain inventory, Frances Lake, Yukon Territory, 1981-.

891. DYKE, A.S., Geol. Surv. Can.:
Quaternary geology– terrain inventory, Prince of Wales Island, King William Island and adjacent mainland Keewatin, 1981-.

892. DYKE, A.S., Geol. Surv. Can.:
Quaternary history and surficial materials of northwestern Baffin Island, District of Franklin, 1983-.

893. EDLUND, S.A., Geol. Surv. Can.:
Surficial geology – terrain inventory, Bathurst-Cornwallis and eastern Melville Islands, District of Franklin, 1974-

894. FARVOLDEN, R.N., KARROW, P.F., GREENHOUSE, J.G., ROSS, L., PEHME, P., Univ. Waterloo (Earth Sciences):
Subsurface stratigraphy, Kitchener-Waterloo, using borehole geophysics, Ontario, 1982-85; M.Sc. theses (Ross, Pehme).

Compilation of pre-existing subsurface data along cross-sections is followed by drilling of one continuously-cored hole and two other none-cored holes, all geophysically logged. Sample analyses and visual logging provide calibration of geophysial records which are then extrapolated.

A first leg from Greenbrook Well Field to the Grand River was completed in 1982 and the second leg north to Waterloo is in progress. A third and final leg to the west is planned for this year.

895. FENTON, M.M., ANDRIASHEK, L.D., Alberta Research Council (Geol. Surv.):
Quaternary stratigraphy and surficial geology Sand River map sheet, Alberta, 1976-84; M.Sc. thesis (Andriashek).

All laboratory analyses completed. Surficial geology map and bedrock topography map completed with printing in early 1983. Stratigraphic synthesis nearing completion. Report about 80% complete, with submission to editing in mid 1983. New scientific findings include definition of 11 previously unrecognized preglacial and interglacial units and the subdivision of previously recognized till units.

896. FENTON, M.M., MOUGEOT, C., Alberta Research Council (Geol. Surv.):
Quaternary stratigraphy and surficial geology of the Vermilion map sheet 73E, Alberta, 1978-85.

Field work is now complete except for checking a few problem areas. Laboratory analyses are 80% finished. Final airphoto interpretation and preparation of surficial geology map has begun and is approximately 40% completed. Scientific findings include the recognition of at least three texturally and lithologically distinct tills in the eastern half of the map area. These tills are tentatively correlated with glacial formations recognized in the eastern half of the Sand river map area.

897. FENTON, M.M., PAWLOWICZ, J., MOELL, C., Alberta Research Council (Geol. Surv.):
Plains coal mine highwall stability, Alberta, 1984-86.

Glaciotectonic map prepared for the Highvale mine. Coring program to investigate glaciotectonic terrain south of Pit 03 completed. Surface geophysics study on same area completed. Analysis of downhole and surface geophysics for detection of thrust terrain continuing.

898. FORD, M.J., GEDDES, R.S., Ontario Geol. Surv.:
Quaternary geology of the eastern Algonquin Park region, Ontario, 1981-85.

899. FORTESCUE, J.A.C., BAKER, C.L., Ontario Geol. Surv.:
Overburden drilling in the Black River – Matheson area, Ontario, 1984-85.

Overburden drilling in the research area will concentrate on determining the nature and stratigraphy of Quaternary deposits. Samples of tills and clastic unit will be processed for heavy minerals and subsequently analyzed by geochemical method. To show the relationship of glacial sediments to bedrock is the Matheson area and suggest how this knowledge would be of use in drift prospecting.

900. FULTON, R.J., Geol. Surv. Can.:
Quaternary geology inventory, southern Labrador, 1969-.

901. FULTON, R.J., Geol. Surv. Can.:
Quaternary geology of the Canadian Cordillera, 1975-.

902. FULTON, R.J., Geol. Surv. Can.:
Surficial geology, Cobden area (Quebec part), 1982-.

903. GABERT, G., ANDRIASHEK, L.D., Alberta Research Council (Geol. Surv.):
Hydrogeology of the oil sands, Cold Lake Area project (HOSCLAP), north-central Alberta, 1982-84.

Input from the Alberta Geological Survey involves extension of Quaternary stratigraphy into Vermilion (NTS 73E) and Tawatinaw (83I) map areas. This extension done on a reconnaissance level, primarily from electric log picks.

904. GADD, N.R., Geol. Surv. Can.:
Correlation of Quaternary geology; Great Lakes-St. Lawrence Valley region, 1978-.

See:

Notes on the deglaciation of southern Quebec; Geol. Surv. Can., Paper 83-1B, p. 403-412, 1983.

905. GEDDES, R.S., Ontario Geol. Surv.:
Quaternary mapping-western Algonquin Park area, Ontario, 1982-84.

See:

Quaternary geology of Algonquin Park-northwestern part; Ontario Geol. Surv., Prel. Map P-2608, 1983.

Results will be combined into an Open File Report and also a Geology Guide, under direction of M.J. Ford, who completed work on the eastern part of Algonquin Park.

906. GEDDES, R.S., Ontario Geol. Surv.:
Quaternary mapping and special projects Hemlo area, Northern Ontario, 1983-84.

See:

An exotic till in the Hemlo area, Northern Ontario; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 66, 1984.

Completion of 2-1:50 000 scale Quaternary maps plus investigation of the use of the Quaternary deposits for gold exploration in the Hemlo area.

907. GRANT, D.R., Geol. Surv. Can.:
Surficial geology, St. Anthony-Blanc Sablon map-areas, Newfoundland, 1969-.

908. GRANT, D.R., Geol. Surv. Can.:
Surficial geology, Cape Breton Island, Nova Scotia, 1970-.

909. GRANT, D.R., Geol. Surv. Can.:
Surficial geology of Newfoundland, 1974-.

910. GRANT, D.R., Geol. Surv. Can.:
Quaternary stratigraphy Yarmouth Region, Nova Scotia, 1979-.

911. GWYN, Q.H.J., BROOKFIELD, M.E., MARTINI, I.P., LESSARD, G., Univ. Sherbrooke (Géographie), Univ. Guelph (Land Resource Science):
Lithologie, stratigraphie et étude géotechnique des dépôts quaternaires dans le sud du Québec et de l'Ontario, 1978-84.

Voir:

Leda clay from deep boreholes at Hawkesbury, Ontario, Part I: Geology and geotechnique; Can. Geotechnical J., vol. 20, no. 2, p. 288-298, 1983.

912. GWYN, Q.H.J., LAURIOL, B., BONN, F., HÉTU, B., Univ. Sherbrooke (Géographie):
Hydrogéologie et hydrogéomorphologie de la dissolution des roches carbonatées au nord du golfe du Saint-Laurent, 1981-86.

913. HODGSON, D.A., Geol. Surv. Can.:
Surficial geology and geomorphology of central Ellesmere Island, Distrit of Franklin, 1972-.

914. HODGSON, D.A., Geol. Surv. Can.:
Surficial geology, geomorphology and terrain inventory of the Ringnes and adjacent islands, District of Franklin, 1976-.

915. HUGHES, O.L., Geol. Surv. Can.:
Quaternary geology, Aishihik Lake, Yukon, 1965-.

916. HUGHES, O.L., Geol. Surv. Can.:
Quaternary stratigraphy of Old Crow Basin and Porcupine River Valleys, Yukon, 1968-.

917. HUGHES, O.L., Geol. Surv. Can.:
Quaternary geology, Mayo-McQuesten, Yukon Territory, 1979-.

918. JACKSON, L.E., Jr., Geol. Surv. Can.:
Quaternay geology, terrain inventory, Kananaskis Lakes, Alberta, 1974-.

919. JACKSON, L.E., Jr., Geol: Surv. Can.:
Quaternary geology and terrain inventory, Nahanni-Sheldon Lake-Finlayson Lake, Yukon and District of Mackenzie, 1980-.

920. KARROW, P.F., Univ. Waterloo (Earth Sciences):
Quaternary sea level chronology and paleontology of west-central Florida, 1983-84.

By dating molluscs and sediments to determine times of high sea level near Tampa, Florida. A rich vertebrate record, only roughly dated from species ranges, and spanning the Quaternary, occurs in association with shell beds associated with high sea levels. Only man-made exposures in active borrow pits can be examined because of the low relief and high water table in the area. Vertebrates represent low sea level

times and since they occur on top of, between, and below shell beds, a chronology may be established by amino acid and thermoluminescence analysis.

921. KARROW, P.F., KERR-LAWSON, L., HANN, B.J., Univ. Waterloo (Earth Sciences):
Paleontology of the Don Formation (Quaternary) of Toronto, Ontario, 1963-; M.Sc. thesis (Kerr-Lawson).

Sample washing and sieving nearly completed and picking of fossils in progress. A varied microvertebrate fauna (including fish) is being recovered. C-O isotope analyses on molluscs will be undertaken when picking completed.

A manuscript on cladocera has been submitted and under revision after review.

Amino acid analysis of wood is underway to determine the age of the Toronto interglacial.

922. KARROW, P.F., MILLER, B.B., MACKIE, G., Univ. Waterloo (Earth Sciences), Kent State Univ. (Geology), Univ. Guelph (Zoology):
History, paleontology, and age of glacial Great Lakes, 1957-.

Additional fossil sites were examined along the north shore of Lake Huron and Lake Superior and mollusc assemblages are being analysed.

923. KARROW, P.F., ZILANS, A., Univ. Waterloo (Earth Sciences):
Late Quaternary history, northwestern Lake Huron, Ontario, 1980-85; M.Sc. thesis (Zilans).

Records and samples held by G.S.C. are being compiled for the Mackinaw Basin, northwestern Lake Huron, to determine and explain the submerged geomorphology and how it related to that of surrounding land areas. Two ice flow directions in the district have a bounding contact that extends toward the basin, which should have been covered by the Onaway advance (="Valders"=Two Rivers). During postglacial low-water stages the basin carried Huron basin and Michigan basin drainage. A final report on the Quaternary geology of St. Joseph Island was completed for the Ontario Geological Survey.

924. KASZYCKI, C.A., Geol. Surv. Can.:
Glacial erosion of the Canadian Shield, 1978-.

925. KLASSEN, R.A., Geol. Surv. Can.:
Quaternary geology inventory, lower Nelson River basin, Manitoba, 1971-.

926. KLASSEN, R.A., Geol. Surv. Can.:
Surficial geology and Quaternary stratigraphy of north Baffin-Bylot Islands, District of Franklin, 1978-.

927. KLASSEN, R.A., Geol. Surv. Can.:
Drift prospecting, east-central Labrador, 1982-.

See:

A preliminary report on drift prospecting studies in Labrador: Part II; Geol. Surv. Can., Paper 84-1A, p. 247-254, 1984.

Ice flow directions and drift composition, Churchill Falls, Labrador; ibid., p. 255-258, 1984.

928. KLASSEN, R.W., Geol. Surv. Can.:
Quaternary geology, southwestern Saskatchewan, 1983-.

See:

Quaternary geology of southern Saskatchewan; Geol. Surv. Can., Paper 84-1A, p. 641, 642, 1984.

929. LASALLE, P., Québec Ministère Énergie et Ressources:
Géologie des sédiments Meubles du Sud-Est de la Gaspésie, Québec, 1983-85.

Voir:

Géologie des Sédiments Meubles de la Région New Richmond New-Carlisle; Québec Ministère Énergie et Ressources, DP 83-29, 1984.

Cartographie 1/50 000 des sédiments quaternaire du sud-est de la Gaspésie.

930. LAST, W.M., HILLAIRE-MARCEL, C., Univ. Manitoba (Earth Sciences), Univ. Québec à Montréal (Sciences de la terre):
Stable isotope geochemistry of Lake Manitoba, 1983-85.

To compliment previous sedimentologic studies of Holocene sediments in Lake Manitoba, C and O stable isotopes are being examined in endogenic carbonates and organic matter in the sediments. The isotope data will help document the paleoclimatology and paleoproductivity of Lake Manitoba during the past 12,000 years.

931. LEVSON, V.M., RUTTER, N.W., Univ. Alberta (Geology):
Pleistocene glaciations in Jasper National Park, Alberta, 1982-84; M.Sc. thesis (Levson).

Laboratory analysis of samples collected in the field is now being carried out. Organic materials have been sent for radiocarbon dating and a volcanic ash has been analyzed with the electron microprobe. Minor field work may be carried out in the spring of 1984. Thesis writing will be carried out in the summer and fall of 1984.

932. MARTINEAU, G., BOUCHARD, M.A., PRICHONNET, G., BRISSON, L., Québec Ministère Énergie et Ressources:
Géologie du Quaternaire, région de Chibougamau, Québec, 1981-84.

933. MERCIER, A., ST-ONGE, D.A., Univ. Ottawa (Géographie):
The Quaternary of the Richardson River Basin, Northwest Territories, 1982-84; M.A. thesis (Mercier).

Systematic mapping of the surficial deposits in the Richardson River basin, south and west of Coppermine, District of Mackenzie, N.W.T. has yielded strong evidence for the former existence of a glacial lake. A sequence of glacial lakes occupied an extensive portion of the basins drained by the Richardson and Rae rivers. Water bodies were trapped in this large depression to the west of Coronation Gulf by easterly retreating glacier ice. Four lake phases are recognized, each controlled by progressively lower outlets at 330 m, 260 m, 235 m and 165 m a.s.l. It is proposed that the lake which finally drained in a postglacial sea be called Glacial Lake Richardson. The former presence of the glacial lake and the associated deltas and outlets are essential elements in reconstructing the deglaciation history of the area.

934. MUDIE, P.J., Geol. Surv. Can.:
Quantitative Quaternary paleoecology, Eastern Canada, 1982-.

935. OSBORN, G.D., Univ. Calgary (Geology and Geophysics):
Holocene tephrostratigraphy and glacial chronology in the Canadian Cordillera, 1975-.

To 1) identify composition, source, and age of Holocene/Late Pleistocene tephras in the Cordillera, by means of field sampling, microprobe analysis, and C^{14} dating, and 2) use these tephras, as well as independent C^{14} dates, to bracket times of glacial advance and retreat. Elucidation of tephra history is very important as these layers provide absolute dates and allow correlation over wide areas. A prime study area is the Bugaboos area of the Purcell Mountains, B.C., where tephra, wood, and buried soil have been found on or in glacial deposits; analysis and dates are expected to provide a clearer picture of Holocene glacier and climate fluctuations than has heretofore been available.

936. PELLETIER, B.R., Geol. Surv. Can.:
Quaternary paleo-sealevel map of Canada, 1978-.

937. PRONK, A.G., FYFFE, L.R., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Bedrock and till geochemistry in the Trousers Lake area, Victoria County, New Brunswick, 1983-84.

938. RICHARD, J.A., BAKER, C.L., Ontario Geol. Surv.:
Quaternary geology of the Porquis Junction-Watabeag River areas, Ontario, 1984-85.

Quaternary mapping will assist in regional planning and development. Information on the glacial history, stratigraphy and deposits will also be of great use to the exploration community when carrying out drift prospecting programs.

939. RICHARD, S.H., Geol. Surv. Can.:
Surficial geology, Tawatinaw area, Alberta, 1968-.

940. RICHARD, S.H., Geol. Surv. Can.:
Surficial geology, Ottawa Valley lowlands, Ontario-Québec, 1974-.

941. ROGERSON, R.J., EVANS, D.J.A., BELL, T., Memorial Univ. (Earth Sciences, Geography):
Glacier and glacial geology Nachvak Fiord area, Torngat Mountains, Labrador, 1981-85; M.Sc. theses (Evans, Bell).

Four glaciers in Torngat Mountains have been instrumented for mass balance since 1981. In 1983 the programme of mapping the glacial geology of the area commenced and will continue to 1985.

942. SADO, E.V., Ontario Geol. Surv.:
Surficial geology of Ontario, 1984-86.

See:

Interdisciplinary research for an environmental component (acid rain) in regional geochemical surveys (Wawa area), Algoma District; Ontario Geol. Surv., Map 80 713, 1984.

Detailed element abundance/diatom inferred pH relationship for the collection of mineral exploration/environmental information from lakes in the vicinity of Wawa, District of Algoma; Ontario Geol. Surv., Misc. Paper 116, p. 148-150, 1983.

A small scale study of acid lakes in the area north of Lake Wanapitei, District of Sudbury; ibid., p. 161-163, 1983.

Compilation of all existing data regarding the distribution of surficial (glacial) sediments for the Province of Ontario at a scale of 1:1 000 000. To examine the feasibility of adding an environmental component to future regional geochemical surveys which employ lake sediment sampling. In addition, sampling and analysis methods developed for the Wawa area are being tested in a small area to the north of Lake Wanapitei near Sudbury.

943. ST-ONGE, D.A., Geol. Surv. Can.:
Surficial geology, north-central District of Mackenzie, 1983-.

See:

Surficial deposits of the Redrock Lake area, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 271-278, 1984.

944. SCHREINER, B.T., MAATHUIS, H., Saskatchewan Research Council (Geology):
Geology and groundwater resources of southern Saskatchewan, 1983-.

The project consists of mapping and evaluating bedrock, buried valley, interfill, and surficial aquifers. A series of maps will delineate the areal extent and thickness of the aquifers and overlying deposits. Cross-sections will illustrate the stratigraphic position and interrelationship of the acquifers. Water levels, quality,

flow directions and other hydrologic parameters will be shown. A preliminary evaluation of groundwater quantity and quality may be included. This work is based on existing information supplemented by field investigations. The project is focussing on the groundwater resources in the North Battleford area (73C), and will be continued in the Melville (62L, K) and Saskatoon areas (73B).

945. SHARPE, D.R., Geol. Surv. Can.:
Quaternary geology, southwestern Victoria Island, District of Franklin, 1983-.

See:

Late Wisconsinan glaciation and deglaciation of Wollaston Peninsula, Victoria Island, Northwest Territories; Geol. Surv. Can., Paper 84-1A, p. 259-269, 1984.

946. SHETSEN, I., Alberta Research Council (Geol. Surv.):
Quaternary geology, southern Alberta, 1978-86.

Quaternary Geology map on a scale of 1:500 000 has been completed for the area south of 52°. Field stratigraphic study has been continued in the area south of 52°, and was extended to the area north of 52°.

947. SHILTS, W.W., Geol. Surv. Can.:
Properties and provenance of till, 1969-.

See:

Sonar evidence for postglacial tectonic instability of the Canadian Shield and Appalachians; Geol. Surv. Can., Paper 84-1A, p. 567-579, 1984.

948. SHILTS, W.W., Geol. Surv. Can.:
Quaternary geology inventory – southern Keewatin, 1973-.

949. SHILTS, W.W., Geol. Surv. Can.:
Quaternary stratigraphy, Northern Ontario Lowlands, 1983-.

950. SIMPSON, M.A., SCHREINER, B.T., Saskatchewan Research Council (Geology):
Aggregate inventory of Saskatchewan, 1982-.

To obtain an inventory of the aggregate resources of selected areas in Saskatchewan: this involves reconnaissance level mapping at 1:250 000 scale to delineate areas of potential aggregate resources, combined with known aggregate locations. Detailed work is being done around major population centres such as Saskatoon. Maps of 1:50 000 will show aggregate deposits and will include notes on quantities, quality, constraints, etc. A computer data base of aggregate information supplements the information on the aggregate maps. Ground investigations are carried out by pit inspection, sampling, augering and geophysics.

951. SPARKES, B.G., VANDERVEER, D.G., Newfoundland Dept. Mines and Energy:
Surficial and glacial mapping, Central Volcanic Belt, Newfoundland, 1978-.

Mapping was conducted in the Great Gull Pond (12H/1) map area during the 1983 field season as a continuation of the Surficial and Glacial Mapping Program in Central Newfoundland. Field work was started in mid-July and continued until mid-September. Three hundred sites were noted and 500 till samples were collected for particle size analysis and geochemistry. A representation pebble fraction (+8 mm to -16 mm) was obtained at most sites to determine the lithologic composition of the tills. This lithologic study included silt-clay coating, weathering, staining, sphericity, fracturing, mineralogy and texture for each lithology present.

Glacial dispersion in the Great Gull Pond ara is the result of two glacial flows, an early northeastward flow and a later northward flow. The lodgement till in the Gullbridge mine area, which overlies sand and gravel may be related to this later flow or to a more localized advance of ice in the vicinity of Great Gull Pond.

952. STALKER, A.MacS., Geol. Surv. Can.:
Quaternary of southern Alberta, 1965-.

953. STEA, R.R., FINCK, P.W., MacEACHERN, I.A., Nova Scotia Dept. Mines and Energy:
Quaternary mapping and till geochemistry, northern Nova Scotia, 1982-84.

See:

Patterns of glacier movement in Cumberland, Colchester, Hants and Pictou Counties, northern Nova Scotia; Geol. Surv. Can., Paper 84-1A, p. 477-484, 1984.

Till stratigraphy and gold distribution, Forest Hill gold district, Nova Scotia; ibid., p. 651-654, 1984.

954. STEELE, K.G., RUTTER, N.W., Univ. Alberta (Geology):
Utilizing glacial geology in uranium exploration, Dismal Lakes, Northwest Territories, 1981-84; M.Sc. thesis (Steele).

To delimit the bedrock source of a field of uraniferous sandstone boulders located west of Dismal Lakes, N.W.T. Investigations of 1) glacial geology, 2) the boulder field and 3) till geochemistry in the vicinity of the boulder field, resulted in the proposal of a source area. The likely bedrock source is up ice from the main boulder concentration, with a gap between the proposed source and the first occurrence of mineralized float. The proposed source area closely agrees with; uranium anomalies in the till, a zone of increased bedrock fracturing, the last ice flow direction, and boulder transport distance indicators.

955. STEPIC, J.M., NIELSON, E., LAST, W.M., Univ. Manitoba (Earth Sciences):
The origin of diamictons in the Moosenose pit, Winnipeg, Manitoba, 1983-84; M.Sc. thesis (Stepic).

Diamictons interbedded with glaciofluvial sediments in the Moosenose pit were formed as ice advanced into the Birds Hill area during Late Wisconsin time. The diamicton units are poorly sorted, heterogeneous and contain a wide range of particle sizes in a mud supported matrix. Twenty-five samples from four diamicton units were collected for grain size analysis. The sediment analysis revealed variable textures between diamicton units and within each diamicton bed.

Four stages of diamicton deposition are interpreted in the Moosenose pit. Stage 1 deposited a proximal facies flow till unit which has a massive structure and normal grading. Stage 2 deposited a distal facies flow till unit interbedded with glaciofluvial sediments. This unit is stratified and contains discrete normal graded sorted inclusions and interfingering sand lenses formed by the shearing affect of subaqueous sediment flow. Stage 3 deposited a proximal facies flow till unit which is interbedded with glaciofluvial sand. This unit has a massive structure and reverse grading.

Subrounded to rounded clasts in the flow till units indicate reworking prior to deposition. The rounding occurred as debris from the ice was released within the esker channel and transported to the snout forming a debris apron. As the ice melted, debris spawled off the debris apron and entered the lake as subaqueous debris flows.

The presence of subaqueous debris flows interbedded with glaciofluvial sediments suggests a proglacial lake environment where deposition of debris flows was occurring intermittently with glaciofluvial sediment.

The sequence is capped by a lodgement till which contains large rafted clasts in a compact and fissile matrix. The lodgement till suggests a glacial environment where debris was deposited subglacially during glacial readvance.

956. TELLER, J.T., MAHNIC, P., Univ. Manitoba (Earth Sciences):
History of the Nipigon Basin link between east and west, 1983-86; M.Sc. thesis (Mahnic).

See:

The Lake Agassiz-Lake Superior connection; Geol. Assoc. Can., Spec. Paper 26, p. 261-290, 1983.

Quaternary stratigraphy and history in the southern part of the Lake Agassiz basin; ibid., p. 261-290, 1983.

Maximum extent and major features of Lake Agassiz; ibid., p. 43-45, 1983.

Lake Agassiz periodically overflowed eastward through the Nipigon basin into Lake Superior during the late phases of glaciation. A series of channels west of the Nipigon basin, which are progressively lower in elevation toward the north, were used as the Rainy Lobe wasted northward. A rapid decline in the level of Lake Agassiz occurred each time the ice dam failed and allowed catastrophic discharge through a lower outlet. New cores from the Lake Superior Lowlands east of Thunder Bay record some of the episodes of discharge from Lake Agassiz, and display both the red colouration associated with Lake Superior dominated sedimentation and the grey colouration related to sediments derived from Lake Agassiz and Lake Nipigon.

957. TERASMAE, J., Brock Univ. (Geological Sciences):
Chronology and correlation of ice retreat and glacial lake phases in the northern Lake Ontario region, 1983-85.

See:

Rate of podzolic soil formation near Hudson Bay, Ontario; Can. J. Soil Sci., vol. 64, p. 31-49, 1984.

Diatoms as indicators of the rate of lake acidification; Water, Air, and soil Pollution, vol. 21, p. 375-386, 1984.

Chronology and correlation of glacial lake phases in the northern Lake Ontario region; Geol. Assoc. Can. – Mineral. Assoc. Can., Programe with Abstracts, vol. 9, p. 110, 1984.

Involves a combined study of Quaternary geology, palynology and radiocarbon dating at selected sites in the region between the Upper Ottawa River valley and Lake Ontario for the purpose of establishing a more detailed chronology of deglaciation and a correlation of late-glacial events. As an additional objective, the results of the project will be used for an evaluation, and possible verification of current conceptual models of deglaciation processes and rates, and ice sheet dynamic models pertinent to the eastern Great Lakes region.

958. THIBAULT, J.J., BARNETT, D.E., New Brunswick Dept. Nat. Res. (Mineral Resources Div.):
Quaternary geology and aggregate resources of the Sisson Branch Reservoir (21 O/6) map-area, New Brunswick, 1983-84.

Field mapping and sampling of surficial deposits was carried out in the Sisson Branch Reservoir (21 O/6) map-area of northwestern New Brunswick. To provide basic information on: 1) the location and extent of granular aggregate deposits and on the quality and quantity of the material; 2) the Quaternary history of the area; and 3) the variation in texture and chemical composition of the till.

959. VANDERVEER, D.G., BUTLER, A.J., BATTERSON, M.J., Newfoundland Dept. Mines and Energy:
Regional Quaternary mapping – northeast of Gander, Newfoundland; Map N.T.S. areas 2E/1 plus North half of 2D/16, 1983-85.

Regional lake sediment geochemistry surveys had identified a number of interesting anomalies in the area northeast of Gander. Quaternary mapping at a regional 1:50 000 scale plus till sampling on Map N.T.S. 2E/1 and parts of 2D/16 is aimed at defining the geochemical pattern in the tills, describing the distribution of drift across the area, and opening the possibility of mineralization from the Gander River Ultramafic Belt being dispersed throughout the area.

Two glacial regimes have been identified; an early flow to the east (090 ± 15°) with a later overprint revealing a radial flow pattern that may be related to a remanent ice cap in the area.

There is a general lack of overburden towards the coast and in the northern half of the field area. Thicker deposits in the Gambo, Butts Pond area reveal an alternating sequence of grey and pink till(?) over gravel. Till overlies a sequence of rhythmites and gravel that have a top surface approximately 18 m above current sea level on the Trans Canada Highway at the Gambo-Dark Dove exit. Salt marshes and peat bog erosion indicate present day sea level rise.

Mineralized float was located in the area of Big Bear Cove Pond and glacial flow and Quaternary mapping are being used to locate the source.

960. VANDERVEER, D.G., DAVENPORT, P.H., McCONNELL, J.W., BATTERSON, M.J., Newfoundland Dept. Mines and Energy:
Regional Quaternary mapping/geochemical dispersal studies – Strange Lake area, Northern Labrador; Map NTS areas 24A/8E, 14D/5, 1983-87.

See:

Geochemical orientation studies and Quaternary mapping around the Strange Lake deposit, Northern Labrador; Newfoundland Dept. Mines and Energy, Min. Devel. Div., Rept. 84-1, 1984.

The Strange Lake rare earth deposit was discovered by the Iron Ore Company of Canada approximately 180 kilometres west of Nain, northern Labrador. The deposit containing Zr-Nb-Be + rare earth was discovered during follow-up of geochemical anomalies in the regional lake sediment and water survey carried out under the Canada/Newfoundland Uranium Reconnaissance Program.

Detailed till sampling by R. Dilabio of the GSC assisted in locating the deposit in an area of extensive drift.

The aim of this project reported here is to place the deposit in a regional context using 1:50 K Quaternary mapping, frost, boil sampling, till geochemistry and lake and stream sediment geochemistry dispersal studies. In addition, the geomorphological data will provide a basis for future studies in the area for evaluating drift prospecting technologies to locate other similar deposits and to support environmental, geotechnical and engineering studies should development of the deposit proceed.

Quaternary mapping was begun in 1984 on 24A/8 and 14D/5. In addition, airphoto interpretation of the surficial geology was conducted on a strip between the deposit and the coast extending from the Fraser River in the north to the Ikadlivik Brook in the south.

961. VINCENT, J.-S., Geol. Surv. Can.:
Surficial geology inventory, Banks Island, District of Franklin, 1974-.

See:

The late Tertiary-Quaternary stratigraphic record of the Duck Hawk Bluffs, Banks Island, Canadian Arctic Archipelago; Can. J. Earth Sci., vol. 20, no. 1, p. 1694-1712, 1983.

Glacial and nonglacial sediments of Matuyama paleomagnetic age on Banks Island, Canadian Arctic Archipelago; Geology, vol. 12, no. 3, p. 139-142, 1984.

962. VINCENT, J.-S., Geol. Surv. Can.:
Surficial geology inventory, western Victoria Island, District of Franklin, 1981-.

963. VINCENT, J.-S., Geol. Surv. Can.:
Quaternary stratigraphy of the Beaufort coast, Yukon and District of Mackenzie, 1983-.

964. WALTER, R.C., WESTGATE, J.A., Univ. Toronto (Geology):
Late Cenozoic tephrostratigraphy of the hominid-bearing Middle Awash sediments, Ethiopia, 1981-85.

See:

Geochronology, stratigraphy and geochemistry of Cindery Tuff in Pliocene hominid-bearing sediments of the Middle Awash; Nature, vol. 308, no. 5954, p. 26-31, 1984.

Paleoanthropalogical discoveries in the Middle Awash Valley, Ethiopia; Nature, vol. 307, no. 5950, p. 423-428, 1984.

Geochemical investigation of volcanism in the west-central Afar, Ethiopia; Carnegie Inst. Dept. Terrestrial Magnetism, Yearbook, p. 491-497, 1983.

965. WATTS, S.H., Sir Sandford Fleming College (Geology):
Bedrock weathering processes and products under arid arctic conditions, 197984.

See:

Weathering processes and products under arid Arctic conditions: a study from Ellesmere Island, Canada; Geografiska Annaler, vol. 65A, no. 1-2, p. 85-98, 1983.

Research will be undertaken in 1984 to examine various processes responsible for the production of an interesting assemblage of highly weathered bedrock features developed in granites exposed in an upland area west-northwest of Old Crow in the northern Yukon Territory. Particular attention will be given to documenting the range of forms present. Interrelationships of lithologic, climatic and topographic factors in the development and preservation of these forms will be evaluated.

966. WESTGATE, J.A., WALTER, R.C., Univ. Toronto (Geology):
Late Cenozoic tephrochronology of Alaska and the Yukon Territory, 1975-.

See:

Old Crow tephra: a new late Pleistocene stratigraphic marker across Alaska and the Yukon Territory; Quaternary Research, vol. 19, p. 38-54, 1983.

Volcanological implications of bimodal grain size distribution and secondary thickening in some distal air-fall ash layers; Nature, vol. 301, p. 115-119, 1983.

REMOTE SENSING/TELÉDETECTION

967. AMOS, C.L., Geol. Surv. Can.:
Landsat calibration for suspended sediment concentration in marine coastal environments, 1978-.

968. BARNETT, P.J., SINGHROY, V.R., Ontario Geol. Surv.:
Evaluation of remote sensing techniques for locating surface and near-surface mineral aggregate, southwest Oxford Township, Ontario, 1982-85.

Report is in progress and will be completed by the 1985.

969. BÉLANGER, J.R., Geol. Surv. Can.:
Remote sensing applied to Quaternary geology and mineral tracing, 1978-.

970. BONN, F., DUBOIS, J.M.M., EL-SABH, M., Univ. Sherbrooke (Géographie):
Étude de la dynamique de l'estuaire du Saint-Laurent par thermographie aérienne et spatiale, 1982-84.

Détermination de la dynamique multi-temporelle des courants marins par imagerie des satellites NOAA et H.C.M.M.

971. BONN, F., DUBOIS, J.M.M., GWYN, Q.H.J., MORIN, D., ROYER, A., BROCHU, R., Univ. Sherbrooke (Géographie):
Développement de méthodologies d'interprétation quantitative des images de télédétection en géomorphologie continentale et littorale, 1980-86.

Voir:

Construction, interpretation and comparison of thermal inertia images obtained from airborne data in a humid and in an arid environment; 17th Internat. Symp. on Remote Sensing of Environment, Environmental Res. Instit. Michigan, summaries, p. 160, 1983.

Canadian Landsat studies for monitoring resource development: a summary; Advances in Space Res., vol. 2, no. 8, p. 151-154, 1983.

Classification des environnements géologiques de l'île d'Anticosti: une approche utilisant une simulation spectrale du satellite Landsat-4; Société internationale de photogrammétrie et de télédétection, résumés, p. IV-10, 1983.

Traitements numériques d'images satellites: application au logiciel "VICAR"; Département de géographie, Univ. Sherbrooke, Bull. de recherche, collection hors série no. 1, 1983.

Distinction entre différents couverts végétaux par analyse multidate des images LANDSAT; Annales de l'ACFAS, vol. 50, p. 117, 1983.

972. BONN, F., GWYN, Q.H.J., DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Développement de méthodes d'interprétation de données simulées Radarsat, SPOT et Landsat-4 en géomrophologie et en pédologie, 1980-87.

Voir:

Télédétection et caracteristiques physiques des dépôts meubles dans un milieur anciennement englacé du sud du Québec; Géographie physique et Quaternaire, vol. 37, no. 1, p. 107-117, 1983.

973. BONN, F., GWYN, Q.H.J., ROCHON, G., DUBOIS, J.M.M., Univ. Sherbrooke (Géographie):
Mise au point de clefs d'interprétation des images radar et micro-ondes passives en sciences de la terre, 1982-86.

Voir:

Classification de différents types de végétation par l'analyses d'images radar en bande C; Société int. de photogrammétrie et de télédétection; résumés, p. P-III-1, 1983.

Seasat-A detection of geomorphologic phenomena in the St. Lawrence valley, Québec; 17th Internat. Symp. on Remote Sensing of Environment, Environmental Res. Instit. Michigan, summaries, p. 215, 1983.

Recherches sur l'utilisation de l'imagerie radar dans l'inventaire des ressources; Annales de l'ACFAS, vol. 50, p. 112, 1983.

Optimisation de l'utilisation du radar par l'élaboration de clefs d'interprétation.

974. BONN, F., PESANT, A., BROCHU, R., Univ. Sherbrooke (Géographie):
Évaluation des possibilités des nouvelles bandes spectrales des capteurs THEMATIC MAPPER et SPOT dans le domaine agraire, 1982-85.

Voir:

La réponse spectrale de diverses unités d'utilisation du soil en milieu agricole et périurbain dans les fenêtres 1,55 - 1,75 et 2,08 -2,35 microns; Société internationale de photogrammétrie et de télédétection, résumés, p. P-IV-5, 1983.

Évaluation des possibilités de SPOT et de Thematic Mapper en agriculture.

975. GORMAN, W.A., HOGG, A., Queen's Univ. (Geologial Sciences):
Landsat evaluation of microdrainage in the Kenora area, Ontario, 1983-84; B.Sc. thesis (Hogg).

To compare the information on microdrainage available from landsat color composite images with the availability of the same data on standard black and white air photos. The synoptic view available on the imagery is expected to be more helpful in interpretation of the origin of the drainage, while the improved resolution of the air photos is expect to give more detail. The study should show whether extra detail is more valuable than synoptic viewing in drainage evaluation.

976. SINGHROY, V.R., SPRINGER, J.S., BRUCE, W., Ontario Geol. Surv.:
Remote sensing applied to vein set recognition, 1984-85.

Mineral stress in vegetation will be tested by MEIS remote sensing over barium-strontium-lead veins. The air-borne measurements will be backed by data enhanced electronically to reveal fracture patterns and by ground truthing which will include luminescence measurements.

977. SLANEY, V.R., Geol. Surv. Can.:
Remote sensing applications, 1981-.

978. SPRINGER, J.S., MUSSAKOWSKI, R., BRUCE, W., Ontario Geol. Surv.:
Mineral commodities at the re-excavated Paleozoic unconformity: MEIS search for the unconformity, 1984.

The Paleozoic unconformity is a site of deep weathering and local placer concentration. Remote sensing technology developed in acid terrains will be tested on a fossil horizon of tropical weathering using very sensitive spectral separation.

979. TANGUAY, M., PETRYK, A.A., SEUTHÉ, C., Québec Ministère Énergie et Ressources:
Analyse des photo-linéaments de la région du bassin d'Anticosti, 1983-85.

L'étude de praticabilité entrepris en 1982, a suggéré des limites possibles d'une étude des photo-linéaments d'Anticosti et des Mingan basées sur des images de Landsat; première étape d'analyse des photo-linéaments des photos-aériennes à l'échelle de 1:40 000 a débuté en novembre 1983.

980. TANGUAY, M.G., SEUTHE, C., École Polytechnique (Génie minéral):
Analyse des linéaments d'Anticosti, Québec, 1984-86.

Déterminer les structures favorables à la recherche du pétrole par analyse des linéaments sur photos aériennes et corrélation avec les images LANDSAT.

981. TANGUAY, M.G., SEUTHE, C., GAGNIER, B.M., École Polytechnique (Génie minéral):
Applications des images Landsat et des images SAR en génie et en géologie, 1979-84; thèse de maîtrise (Gagnier).

Voir:

Images Landsat: Guide d'utilisation et sources d'informations géologiques pour la région de Rouyn-Noranda; Rapport de recherche EP82-R-17, École Polytechnique, 1983.

Images Landsat: Exemple d'utilisation géologique pour la région de Val d'Or, Québec; Rapport de recherche EP82-R-38, École Polytechnique, 1983.

Images Landsat: Analyse sectorielle des linéaments et interprétation des grandes structures de la région de Rouyn-Noranda, Québec; Rapport de recherche EP82-R-39, École Polytechnique, 1983.

Développer une méthodologie d'utilisation et d'application des images Landsat et de radar SAR aux divers domaines du génie et de la géologie.

ANCIENT SEDIMENTS/ SÉDIMENTS ANCIENS

982. ASPLER, L., DONALDSON, J.A., Carleton Univ. (Geology):
Sedimentology, stratigraphy and structure of the Nonacho Basin, Northwest Territories, 1978-84; Ph.D. thesis (Aspler).

See:

Progressive development and origin of cleavage in sandstones, Nonacho Basin (Early Proterozoic), Canada; Geol. Soc. Amer., Abstracts with programs, vol. 15, no. 6, p. 518, 1983.

Penecontemporaneous sandstone dykes, Nonacho Basin (Early Proterozoic), N.W.T.; Geol. Assoc. Can.-Mineral. Assoc Can., Program with abstracts, vol. 8, p. 3, 1983.

983. ASPLER, L., DONALDSON, J.A., Carleton Univ. (Geology):
Sedimentology, stratigraphy and structure of the Nonacho Basin, Northwest Territories, 1978-84; Ph.D. thesis (Aspler).

See:

Progressive development and origin of cleavage in sandstones, Nonacho Basin (Early Proterozoic), Canada; Geol. Soc. Amer., Abstracts with programs, vol. 15, no. 6, p. 518, 1983.

SEDIMENTOLOGY/SÉDIMENTOLOGIE

Penecontemporaneous sandstone dykes, Nonacho Basin (Early Proterozoic), N.W.T.; Geol. Assoc. Can.-Mineral. Assoc Can., Program with Abstracts, vol. 8, p. 3, 1983.

983. BARERJEE, I., Geol. Surv. Can.:
Stratigraphy and sedimentology of the Mannville Group, southern Alberta, 1982-.

984. BOEHNER, R.C., GILES, P.S., GIBLING, M., RUST, B.R., BEST, M.A., PRIME, G., COLWELL, J., Nova Scotia Dept. Mines and Energy, Dalhousie Univ. (Geology), Univ. Ottawa (Geology):
Sydney Basin project, Nova Scotia, 1982-84.

See:

Loch Lomond Basin, Cape Breton Island, Windsor Group Project-an update; Nova Scotia Dept. Mines and Energy, Report 83-1, p. 97-104, 1983.

Field mapping has been completed in the Carboniferous Sydney Basin, Loch Lomond Basin and Glengarry half-graben. Final data compilation and analysis is in progress and when completed will be incorporated in geological maps and report(s) dealing with formal lithostratigraphy. Sedimentology and facies analysis together with the geological setting of a variety of sediment hosted mineral deposits, is being studied.

985. BROUGHAN, F., HENDRY, H.E., Univ. Saskatchewan (Geological Sciences):
Sedimentology of the Ravenscrag Formation, southern Saskatchewan, 1982-84; M.Sc. thesis (Broughan).

The Palaeocene Ravenscrag Formation in southwestern Saskatchewan was deposited as an eastward prograding wedge of alluvium. The gray beds, extensive coals, and abundant plant remains in the lower part of the formation were deposited under relatively wet conditions compared to the buff beds of the upper part of the formation. The gray beds contain mainly fossils of aquatic and herbaceous plants with remains of trees adapted to swampy conditions, whereas in the buff facies tree species dominate.

986. BURBIDGE, G.H., RUST, B.R., Univ. Ottawa (Geology):
Sedimentary environments of Late Quaternary deposits in the Vaudreuil area, Quebec, 1983-85; M.Sc. thesis (Burbidge).

987. CAMERON, B.W., ROGERS, H.D., JONES, J.R., Acadia Univ. (Geology):
Silicification, paleontology and basinal analysis of the Scots Bay Formation of Nova Scotia, 1981-86.

Over the last two years, we have made several new discoveries in the Scots Bay Formation, namely a totally new silicified fossil microfauna (gastropods and ostracodes)

and microflora (charaphytes), algal stromatolites and potential host springs deposits. We intend to determine accurately the age, paleoecology, sedimentary environments and basinal geometry of this lacustrine formation. This proposed research is significant because the Jurassic(?) Scots Bay Formation is not well dated, the newly discovered silicified fossils are unique to eastern North America, paleo-hot springs of siliceous origin are not well documented anywhere, and a new interpretive basinal analysis is now necessary for economic geological and historical geological reasons.

988. CANT, D.J., MOSSOP, G.D., Alberta Research Council (Geol. Surv.):
Petroleum geology – northwestern Alberta, 1983-.

989. CHANDLER, F.W., Geol. Surv. Can.:
Redbed sequences in Canada, 1976-

See:

Fourfold significance of an early Silurian U-Pb zircon age from rhyolite in redbeds, southwest Newfoundland; Geol. Surv. Can., Paper 83-1B, p. 419-421, 1983.

Sedimentary setting of an early Proterozoic copper occurrence in the Cobalt Group, Ontario: a preliminary assessment; Geol. Surv. Can., Paper 84-1A, p. 185-192, 1984.

990. CHANDLER, F.W., Geol. Surv. Can.:
Proterozoic red beds of Richmond Gulf, Quebec, 1977-.

See:

The Richmond Gulf gravity anomaly, northern Quebec-Northwest Territories; Geol. Surv. Can., Paper 83-1B, p. 53-56, 1983.

991. CHIARENZELLI, J., DONALDSON, J.A., MILLER, A.L., LeCHEMINANT, A.N., Carleton Univ. (Geology):
Origin and diagenesis of the sub-Thelon regolith, Aberdeen Lake area, Northwest Territories, 1981-84; M.Sc. thesis (Chiarenzelli).

See:

Chemical weathering and diagensis of the Proterozoic sub-Thelon regolith and Thelon Formation, Northwest Territories; Geol. Assoc. Can.-Mineral. Assoc. Can., Program with abstracts, vol. 8, p. 11, 1983.

992. COOK, D.G., Geol. Surv. Can.:
Comparative studies of structural prototypes and/on sedimentary environments, 1970-.

993. DONALDSON, J.A., KERANS, C., ROSS, G., Carleton Univ. (Geology):
Sedimentology and stratigraphy of the Hornby Bay and Dismal Lakes Group, Northwest Territories, 1978-84; Ph.D. thesis (Ross).

See:

Timing of emplacement of the Muskox Intrusion: Constraints from Coppermine Homocline cover strata; Can. J. Earth Sci., vol. 20, p. 673-683, 1983.

Proterozoic aeolian quartz arenites from the Hornby Bay Group, Northwest Territories, Canada: Implications for Precambrian aeolian processes; Precambrian Res., vol. 20, p. 149-160, 1983.

994. DONALDSON, J.A., RUST, B.R., MICHEL, F.A., WATKINSON, D.H.W., MUSTARD, P., RAINBIRD, R., WILSON, B., GOODZ, M., Carleton Univ. (Geology), Ottawa Univ. (Geology):
Sedimentary rocks and strata-bound mineralization in the Cobalt region of northeastern Ontario, 1983-86; M.Sc. theses (Mustard, Rainbird, Wilson, Goodz).

Proterozoic strata of the Cobalt Group are being studied in the Cobalt region to refine our understanding of the stratigraphy, sedimentology and mineralization of these strata. Emphasis is being placed on assessing the relationship of stratiform concentrations of economic minerals to particular beds in the Coleman Member of the Gowganda Formation. This project will provide new insights into controls of base metal/precious metal accumulation in general, and in the Cobalt region in particular.

995. DOWNING, K.P., WALKER, R.G., McMaster Univ. (Geology):
Viking sands-depositional processes and environments and their relationship to sand body geometry, Alberta, 1983-85; M.Sc. thesis (Downing).

On-going research: Summer 1983 – detailed logging, photography-25 cores, collection of gamma, sonic logs for winter correlations in study area; Winter 1983 – one week detailed core logging, further collection of log traces for correlations, preparation of technical memorandum.

Upcoming research: Summer 1984 – detailed logging of approximately 150 cores, further log correlations on more regional scale; Winter 1984 – write-up report.

996. DUNN, C.E., Saskatchewan Geol. Surv.:
Geology of the Middle Devonian Dawson Bay Formation in Saskatchewan, 1974-84.

See:

The Dawson Bay Formation and its relationship to the underlying Prairie Evaporite in the Saskatoon area, Saskatchewan; Potash Technology, Pergamon Press, p. 41-46, 1983.

997. EMORY-MOORE, M., HALE, W.E., VAN DE POLL, H.W., SCHAFFER, C., Univ. New Brunswick (Geology):
Mineralogical characteristics of gold-bearing sediments, Eastern Shore, Nova Scotia, 1981-84; M.Sc. thesis (Emory-Moore).

998. FRENCH, H.M., RUST, B.R., NALDRETT, D.N., Univ. Ottawa (Geology):
Late Quaternary marine glacial deposits of the Champlain Sea near Ottawa, 1981-85; Ph.D. thesis (Naldrett).

999. HARRISON, R.S., Alberta Research Council (Geol. Surv.):
Sedimentology and stratigraphy of the bitumen-bearing Upper Devonian Grosmont Formation in northern Alberta, 1980-85.

1000. HARRISON, R.S., CONIGLIO, M., Alberta Research Council (Geol. Surv.):
Genesis and diagenesis of Late Pleistocene carbonates of the Florida Keys; Origin of Key Largo, 1978-84.

See:

Holocene and Pleistocene caliche from Big Pine Key, Florida; Bull. Can. Petrol. Geol., vol. 31, p. 3-13, 1983.

Facies and diagenesis of Late Pleistocene carbonates from Big Pine Key, Florida; ibid., p. 135-147, 1983.

A series of cored boreholes were drilled on the islands of Key Largo and Big Pine Key in the Florida Keys. The purpose of this study was to document the Late Pleistocene stratigraphy of the Keys, to delineate the major depositonal facies, and to evaluate the relative influence of near-surface subaerial, vadose, and fresh-water phreatic diagenesis on these carbonate sequences.

1001. HENDRY, H.E., Univ. Saskatchewan (Geological Sciences):
Quaternary of the South Saskatchewan River, 1981-.

An investigation of the post-glacial stratigraphy and sedimentation of valley-fill alluvium of the South Saskatchewan River.

1002. KAYUMBU, P.M., HENDRY, H.E., Univ. Saskatchewan (Geological Sciences):
Sedimentology of the Martin Group, Uranium City area, northern Saskatchewan, 1983-86; Ph.D. thesis (Kayumbu).

The Martin Group of the Uranium City area consists of alluvial conglomerates and sandstones and lacustrine silts and clays – to establish the depositional and diagenetic history of the basin and to relate this to tectonism and mineralization.

1003. KOSTER, E.H., CURRIE, P.J., Alberta Research Council (Geol. Surv.), Tyrrell Mus. Paleont.:
Sedimentology and coal resources of the Upper Cretaceous Judith River Formation, southern Alberta plains, 1981-85.

See:

Paleochannel sedimentology in the Upper Judith River Formation (Campanian): Dinosaur Provincial Park, S.E. Alberta (abstract); Can. Soc. Petrol. Geol., Mesozoic of Middle North America, Program with Abstracts, p. 50, 1983.

Sedimentology of the Upper Cretaceous Judith River (Belly River) Formation, Dinosaur Provincial Park, Alberta; Can. Soc. Petrol. Geol., Fieldtrip Guidebook No. 1, 1983.

1004. KRAMERS, J.W., Alberta Research Council (Geol. Surv.):
Sedimentology of the Grand Rapids Formation Wabasca oil sand deposit, Alberta, 1973-85.

Continuing study of the sedimentology, facies relationship, petrology, diagenesis and bitumen distribution of the Grand Rapids Formation in northeastern Alberta (Twp. 70-90, Rgs. 13 W4 – Rge. 5 W5).

1005. LAST, W.M., KOVAC, L.J., Univ. Manitoba (Earth Sciences):
Geochemistry, mineralogy, and sedimentology of organic-rich sedimentary units in Manitoba-northeastern Saskatchewan, 1983-86.

Selected Paleozoic and Mesozoic organic-rich mudstone units are being examined in southern Manitoba and Saskatchewan. The organic type, maturity, and richness are being documented in order to determine the depositional and diagenetic controls and settings of the organic-rich units. Mineralogy and inorganic geochemistry are being evaluated in order to assess the role these components play on the use of the shales as possible hydrocarbon fuel resources. At present, most effort has been placed on the Upper Cretaceous Favel and Niobrara Formations.

1006. MIALL, A.D., ELLINGHAM, E., EBERTH, D., Univ. Toronto (Geology):
Fluvial depositional systems, 1966-; M.Sc. thesis (Ellingham), Ph.D. thesis (Eberth).

See:

Variations in fluvial style in the lower Cenozoic synorogenic sediments of the Canadian Arctic Islands; Sedimentary Geol., vol. 38, no. 1/4, p. 499-523, 1984.

Aimed at improving fluvial facies models and studying the relationship between fluvial sedimentation and tectonics. Field components of the project include studies of Late Paleozoic fan deltas in Ellesmere Island (Canyon Fiord Formation), Permian redbeds in New Mexico, and Late Cretaceous to Oligocene alluvial fan, braided and meandering deposits in the Arctic Islands.

1007. MIALL, A.D., WAHEED, A., EYLES, C.H., Univ. Toronto (Geology):
Glaciomarine depositional systems, 1981-; Ph.D. theses (Waheed, Eyles).

To develop facies models for glaciomarine sediments. Many ancient glacial sequences have been interpreted as continental tillites, but detailed sedimentological analysis shows

that in most cases this is incorrect. The deposits formed on continental shelf or slope environments, accumulating by a process of rain out from floating ice bergs plus reworking by traction currents and sediment gravity flows. Current field projects include detailed surface and core studies of the Huronian, Bruce and Gowganda Formations, the Yakataga Formation (Alaska) and various British deposits.

1008. MUIR, I.D., DIXON, O.A., Univ. Ottawa (Geology):
Facies analysis of the Devonian Ramparts reef complex, Mackenzie Mountains, Northwest Territories, 1982-85; Ph.D. thesis (Muir).

1009. NEALE, K.L., DONALDSON, J.A., Carleton Univ. (Geology):
Stratigraphy and sedimentology of the Island Lake area, northern Manitoba, 1981-84; M.Sc. thesis (Neale).

1010. NOBLE, J.P.A., Univ. New Brunswick (Geology):
Faunal and sedimentary history of the northern Appalachian Orogen, Silurian-Devonian, Eastern Canada, 1976-90.

See:

The Llandovery-Wenlock heliolitid corals from New Brunswick, Canada; J. Paleontol., vol. 58, no. 3, p. 867-884, 1984.

1011. PATERSON, D.F., Saskatchewan Geol. Surv.:
Geology and shale-oil potential of the Speckled Shales (Cretaceous) in Saskatchewan, 1982-84.

The Cretaceous Speckled Shales outcrop on the Pasquia Hills of East-central Saskatchewan and have been shown to contain up to 46L/tonne oil over a 33 m interval. The strata extend westward to the Alberta border and southward to the United States border, thus covering some 270 000 km^2 in Saskatchewan. To show their geographic limits, depth of burial, thickness and variations in oil content with a view to assessing their economic potential.

1012. PLINT, A.G., VAN DE POLL, H.W., RYAN, R.J., PICKERILL, R.K., BRIGGS, D.E.G., Univ. New Brunswick (Geology):
Structural and sedimentary studies in the Carboniferous of southern New Brunswick, 1981-84.

See:

The distribution, biota and stratigraphy of a Windsor Group limestone (Mississippian) and associated sediments in the Quaco Head area of southern New Brunswick; Maritime Sed. and Atlantic Geol., vol. 19, no. 3, p. 107-116, 1983.

1013. RICE, R.J., MIDDLETON, G.V., McMaster Univ. (Geology):
Sedimentology of the Okse Bay Group, southwestern Ellesmere island, Arctic Archipelago, 1981-86; Ph.D. thesis (Rice).

The last of three field seasons was completed last summer. Petrographic documentation in progress. Petrography will involve both light and heavy mineral study with the emphasis on providing insight into the source area of the sediments.

1014. ROTTENFUSSER, B.A., Alberta Research Council (Geol. Surv.):
Peace River oil sands study, 1975-84.

1015. RUST, B.R. DILLES, S.J., MASSON, A.G., BEST, M.A., Gibling, M.R., Univ. Ottawa (Geology), Dalhousie Univ. (Geology):
The sedimentology and evolution of the Sydney Basin, Nova Scotia, 1981-85; Ph.D. thesis (Masson), M.A. theses (Dilles, Best).

See:

Sedimentological studies in the Sydney Basin, 1982; Nova Scotia Dept. Mines and Energy, Rept. 83-1, p. 81-95, 1983.

Lacustrine stromatolites and algal laminites in a Pennsylvanian coal-bearing succession near Sydney, Nova Scotia, Canada; Can. J. Earth Sci., vol. 20, p. 1111-1118, 1983.

1016. RUST, B.R., SALAS, C.J., Univ. Ottawa (Geology):
Sedimentology of the Cumberland Group southwest of Joggins, Nova Scotia, 1983-85; M.Sc. thesis (Salas).

1017. ST. PETER, C.J., GEMMELL, D.E., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Albert Formation project, New Brunswick, 1982-85.

For the past two years sedimentological, stratigraphic, geochemical, and structural field studies have been underway on the Albert Formation of southeastern New Brunswick. Field studies will continue during 1984. To determine the quantity, quality, and distribution of high grade oil shales in the Albert Formation. To date petrographic and analytical work has not been undertaken, but is planned for the next year.

1018. TASSÉ, N., INRS-Géoressources:
Sédimentation et diagenèse en relation avec les minéralisations dans les Basses Terres du Saint-Laurent, 1983-86.

1019. VAN DE POLL, H.W., PATEL, I., FOLEY, P., D'ORSAY, A.M., Univ. New Brunswick (Geology):
Basin analysis of the Devonian and Permo-Carboniferous strata of Eastern Canada, 1969-; M.Sc. theses (Foley, D'Oray).

See:

Geology of Prince Edward Island; Prince Edward Island Dept. Energy and Forestry, Energy Min. Br., 1983.

Secondary sedimentary, structures associated with fluidization zones in Permo-Carboniferous redbeds of Prince Edward Island, Canada; Maritime Sed. and Atlantic Geol., vol. 19, p. 49-59, 1983.

Local detailed studies towards an overall basin analysis of the Devonian-Carboniferous-Permian of Eastern Canada have been in progress since 1969. Current studies include: 1) depositional and post depositional history of the Prince Edward Island redbeds, P.E.I.; 2) the Parrsboro area of Nova Scotia; 3) depositional history and physical diagenesis of the coal bearing strata of the Point Aconi area, Cape Breton Island, Nova Scotia; 4) evidence of physical diagenesis in Devonian and Permo-Carboniferous strata of Eastern Canada; 5) stratigraphy, facies and economic geology of the Tetamagouche synclinal area, Nova Scotia, 6) laboratory experiments in rheoplasis during sediment intrusion; and 7) evolution of coal basins of central-northern Nova Scotia.

1020. VILKS, G., Geol. Surv. Can.:
Pleistocene-Holocene sedimentation in Hamilton Inlet and southeastern Labrador Shelf, 1983-.

1021. WIGHTMAN, D.M., Alberta Research Council (Geol. Surv.):
Cold Lake oil sands, Lower Cretaceous, Alberta, 1980-84.

To gain insight into the controls on oil saturation in the Lower Cretaceous Mannville Group by doing regional stratigraphy and detailed facies analysis on the sands.

1022. WILSON, M.A., PATERSON, D.F., Saskatchewan Geol. Surv.:
Sedimentology of Mannville Group (Lower Cretaceous) in the Tangleflags area, west-central Saskatchewan, 1981-84.

An investigation into the sedimentology of the Mannville Group in the Tangleflags area was initiated in September 1981. This study focuses on the interpretation of the depositional environments present in this area. An attempt will be made to relate the sedimentological parameters to the physical properties and diagenetic features of the sediments. The study involves the examination of cores and geophysical well logs.

1023. WOLF, R.R., DALRYMPLE, R.W., Queen's Univ. (Geological Sciences):
Sedimentology of the Cambro-Ordovician sandstones of Eastern Ontario, 1982-85; M.Sc. thesis (Wolf).

See:

Terrestrial and shallow marine environments in the Potsdam Sandstone, Eastern Ontario; Geol. Assoc. Can.-Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 117, 1984.

To undertake a thorough sedimentological investigation of the quartz-rich Cambro-Ordovician sandstones (Potsdam-Nepean Formation) in the Kingston-Brockville-Westport area of Eastern Ontario, in order to facilitate the development of their silica-sand potential. The objectives are: 1) to determine the depositional processes and environments which produced the sandstones and to examine the distribution of silica as a function of depositional conditions, so as to establish the primary controls on silica enrichment; and 2) to map the geographic and stratigraphic distribution of environments within the sandstones so as to unravel their depositional history and provide a better means of internal correlation. The end result should be a predictive model of facies geometry and a set of guidelines for silica exploration. To date 5 major facies have been identified; braided fluvial; aeolian; subtidal to upper intertidal; nearshore to beach; and (tidal?) channel. Terrestrial deposits are preferrentially developed on the Frontenac Axis.

RECENT AND UNCONSOLIDATED SEDIMENTS/SÉDIMENTS RÉCENTS ET NON CONSOLIDÉS

1024. ADSHEAD, J.D., Geol. Surv. Can.:
Geological characterization of Arctic lakes: sediment properties and sedimentary processes, 1977-.

1025. AMOS, C.L., Geol. Surv. Can.:
Sediment dynamics at the head of the Bay of Fundy, 1978-.

1026. AMOS, C.L., Geol. Surv. Can.:
Stability and transport of sediments on Continental shelves, 1980-.

See:

Canadian East Coast multiparameter surveys, 1982; Geol. Surv. Can., Paper 83-1B, p. 331-334, 1983.

1027. BORNHOLD, B.D., Geol. Surv. Can.:
Marine surficial geology and sedimentation, British Columbia, 1975-.

1028. CAMERON, B.W., JONES, J.R., Acadia Univ. (Geology):
A biostratigraphic approach to determining the development and evolution of the Plum Island, Mass., U.S.A., barrier island system, 1981-85.

A biostratigraphic approach is being used to test barrier island models for determining the origin of Plum Island, Massachusetts. Ten cores were taken from a marsh area west of the barrier beach and dune field in order to sample the earlier back-barrier environment. The core samples were analyzed for the presence of microfaunal assemblages and sedimentological data. The presence of **Trochammina inflata** idicates a low salinity to brackish marsh environment early in the development of Plum Island. Garnet mineralogy of the sediments also suggests that the area was not a fresh water environment. This biostratigraphic approach supports the complex soit hypothesis, not the ridge-embayment hypothesis, for the formation of Plum Island.

1029. DALRYMPLE, R.W., Queen's Univ. (Geological Sciences):
Origin of sedimentary structures and grain size distributions, 1971-.

To document the mechanics of formation of the various characteristics of clastic sediments. This includes determination of the stability fields of bedforms, documentation of bedform dynamics as it related to the formation of internal structures, and measurement of the hydraulic conditions governing the genesis of grain size distributions. In addition, longer-term morphological changes are being monitored to determine their influence on the deposits accumulating. The preservation potential of the various features is also of interest. The guiding objective is to provide information which will assist in the paleohydraulic and paleoenvironmental reconstruction of ancient sediments.

1030. FORBES, D.L., Geol. Surv. Can.:
Beaufort Sea coast, 1983-.

1031. HENDERSON, P.J., RUST, B.R., Univ. Ottawa (Geology):
Bottom sediments of Hudson Bay, 1983-85; Ph.D. thesis (Henderson).

1032. HOOGENDOORN, E.L., DALRYMPLE, R.W., Queen's Univ. (Geological Sciences):
Sedimentation and bedform mobility on Sable Island Bank, 1982-86; Ph.D. thesis (Hoogendoorn).

Examination of new bathymetric, sidescan sonar and seismic data shows that 86 shoreface-connected ridges occur on Sable Island Bank in water depths shallower that 45 m around the Island. The main ridge field, containing 80 ridges, occurs to the south and west of the Island in the area stretching continously from East Bar to West Bar. Six ridges occur locally on the north side of the Island. The ridges have average heights, spacings and crest lengths of 5.1 m, 1700 m, and 8-10 km respectively. The maximum ridge height on the Bank is 17 m. The interpretation of seismic data points to a slow eastward migration of the ridges in response to the storm- and tidally-generated currents that occur on the Bank. The interpreted mechanism of sediment transport, supported by sidescan and photographic records, is small-scale bedforms. The internal sedimentary structure of the ridges consists of repetative coarsening upward units with occassional fining upward units. Both coarsening and fining upward units are predicted by two conceptual models. Recent field work consisted of deploying two current meters and collecting bottom photographs, sidescan sonar and seismic records and seabed samples. These will be integrated into the model of ridge related sediment transport and sedimentation patterns.

1033. JANSA, L.F., Geol. Surv. Can.:
Stratigraphy and sedimentology of the Mesozoic and Tertiary rocks of the Atlantic continental margin, 1971-.

1034. LAST, W.M., EGAN, D.M., SCHWEYEN, T.H., SLEZAK, L.A., LOCKHART, E.B., Univ. Manitoba (Earth Sciences):
Sedimentology, geochemistry and evolution of saline and hypersaline lakes of the northern Great Plains, 1981-87.

See:

Sedimentology of Playa Lakes of the northern Great Plains; Can. J. Earth Sci., vol. 21, p. 107-125, 1984.

Sedimentology and geochemistry of saline and hypersaline lakes of the northern Great Plains; Hydrobiologia, vol. 105, p. 245-263, 1984.

Salt lakes are common in the northern Great Plains of western Canada and United States. The sedimentology and geochemistry of selected basins in this region are currently being investigated to gain a basic understanding of the physical, chemical, and biological processes controlling the generation and diagenesis of the Holocene sediments in the salt lakes. This project is also investigating the evolution of the brine systems during the past 14 000 years.

1035. LEMOINE, R.M.J., LAST, W.M., NEWBURY, R., Univ. Manitoba (Earth Sciences):
Sedimentology and stratigraphy of the Wilson Creek alluvial fan, Manitoba, 1983-84; M.Sc. thesis (Lemoine).

The Wilson Creek alluvial fan forms at the base of the Manitoba escarpment in southwestern Manitoba. The fan is composed primarily of sediments eroded from the Pierre Shale Formation (Late Cretaceous) and covers an area of 28 square kilometers. The average radius of the fan is approximately 6 kilometers, with a slope of 0.80° from the fan apex to the fan base. The fan sediments are deposited by streamflow and have a total calculated volume of 12 180 000 cubic meters. The sediments are very poorly sorted, ranging from gravel size clasts to fine-grained silts and clays, with variable degrees of roundness and sphericity. Grain sizes generally show a decrease downfan with an accompaning slight increase in sorting. The surfaces of the grains are abraded and pitted indicating inter-clast collisions in the fluvial system.

The fan is divided into three facies: the proximal facies, the medial facies, and the distal facies. Erosion of the escarpment soon after the final recession of glacial ice 13 000 years ago resulted in the deposition of the sediments into Lake Agassiz, forming a deltaic sequence. Continued erosion after the draining of Lake Agassiz some 11 000 years ago culminated in the deposition of the alluvial sediments and the formation of the alluvial fan. These processes continue to build the fan at the present time.

1036. LUTERNAUER, J.L., Geol. Surv. Can.:
Fraser Delta sedimentation, British Columbia, 1974-.

1037. LUTERNAUER, J.L., Geol. Surv. Can.:
Marine delta sedimentation, British Columbia, 1979-.

See:

Development-induced tidal flat erosion, Fraser River Delta, British Columbia; Geol. Surv. Can., Paper 84-1A, p. 75-80, 1984.

Longest core of Quaternary sediments from Queen Charlotte Sound: preliminary description and interpretation; ibid., p. 647-649, 1984.

Sedimentary environments and postglacial history of the Fraser Delta and lower Fraser Valley, British Columbia; Can. J. Earth Sci., vol. 20, no. 8, p. 1314-1326, 1983.

1038. McLAREN, P., Geol. Surv. Can.:
Coastal geology and processes of British Columbia, 1978-.

See:

The Whytecliff oil spill, British Columbia: sediment trends and oil movement on a beach; Geol. Surv. Can., Paper 84-1A, p. 81-85, 1984.

1039. OTTO, J.E., DALRYMPLE, R.W., Brock Univ. (Geological Sciences):
Sedimentology of the Sixteen Mile Creek Lagoon, Niagara Peninsula, Ontario, Canada, 1980-83; M.Sc. thesis (Otto).

See:

Sedimentation in the 15, 16 and 20 Mile Creek lagoons and implications for lake level changes, Lake Ontario; Proc. 3rd Workshop on Great Lakes Erosion and Sedimentation, 1983.

The Sixteen Mile Creek Lagoon complex, like adjacent lagoons, is a shallow, stagnant environment which is divisible into a series of subenvironments (open lagoon, delta, stream channel, and low and high marshes). These complexes are traps for all of the coarse, and an unknown proportion of the fine, sediment carried by the stream, and they respond sensitively to changing external conditions. The major control on sedimentation prior to 1775 was the gradual (?) and progressive deepening and transgression caused by lake levels rising (≥0.23 cm/year) at a rate faster than sedimentation (0.12-0.20 cm/year). "Sudden" changes in water depth may have occurred as a result of climatic changes (especially at 1690 years B.P.) but these cannot be confirmed. Forest clearing and cultivation by European settlers after 1775 caused a massive increase in sedimentation rates (to 0.64 cm/year), drastically reduced the input of organic material, and changed the sediment colour from brown (derived from soil horizons A & B) to gray (parent material derivative). As a result, the organic-rich sediments which were the dominant lagoonal deposits before this ceased to form and were replaced by a gray silty clay that remains the predominant sediment type accumulating today. Capture of half of the Sixteen Mile Creek by the Twenty Mile Creek 1500-2000 years B.P. had no strong effect on either lagoon.

Trace element concentrations are highly variable but locally show the anticipated upward increase through the Gray Clay, even though concentrations are less than in the Twenty Mile creek Lagoon or Lake Ontario. The variability is attributed primarily to the bioturbating activities of the carp (**Cyprinus carpio**), a process which requires further study and attention. The concentrations of most trace elements are highest in the delta region and near the Queen Elizabeth Highway suggesting that the stream and highway are the major pollution sources. Ni and Zn are significanlty concentrated in the finer sediments whereas Ca is more abundant in coarse grain sizes. No element is preferentially bound to organic material. The extent to which stream-born pollutants (and suspended sediment) by-pass the lagoon and enter Lake Ontario is unknown, but average trace element abundances in modern lagoonal sediments appear to reflect the degree of urban and industrial development in the drainage basin.

1040. PELLETIER, B.R., Geol. Surv. Can.:
Bottom studies of the Beaufort Sea, 1972-.

See:

Sediment sampling of beaches along the Mackenzie Delta and Tuktoyaktuk Peninsula, Beaufort Sea; Geol. Surv. Can., Paper 84-1A, p. 633-640, 1984.

1041. PIPER, D.J.W., Geol. Surv. Can.:
Near-surface geology of the Arctic Island channels, 1982-.

1042. RASHID, M.A., Geol. Surv. Can.:
Geochemical transformations and reactions of organic compounds in Recent marine sediments, 1975-.

1043. RENAUT, R.W., Univ. Saskatchewan (Geological Sciences):
Sedimentology and geochemistry of saline lakes in Western Canada, 1984-.

The study will examine the sedimentology, mineralogy, chemistry and Quaternary history of some little-studied saline lakes in the Kamloops and Peace River districts of British Columbia, and several saline lakes in southern Saskatchewan and Alberta. Particular emphasis will be given to processes and products of efflorescent salt crystallization, fractional dissolution processes, and spring and lacustrine carbonates.

1044. SCHAFER, C.T., Geol. Surv. Can.:
The Recent paleoclimatic and paleoecologic records in fjord sediments, 1980-.

1045. SCHWEYEN, T.H., LAST, W.M., Univ. Manitoba (Earth Sciences):
Sedimentology and paleohydrology of a shallow ectogenic meromictic lake, 1982-84; M.Sc. thesis (Schweyen).

See:

Sedimentology and paleohydrology of Waldsea Lake, Saskatchewan; Proc. Can. Plains, vol. 11, p. 45-59, 1983.

Waldsea Lake is a small (5 km^2), shallow (14.5 m maximum depth) saline lake near Humboldt, Saskatchewan. It has been meromictic at least since 1971. Despite its salinity (25 g l^{-1} mixolimnion, 68 g l^{-1} monimolimnion) it is the locus of a regional park. Sediment cores and dredge samples were obtained in order to study its geochemical/sedimentological regime, developmental history, and man-induced changes.

The post-Hypsithermal basinal sediment record consists of five major stratigraphic units. Each represents major changes in lake level, water chemistry, and trophic state. Unit 1 is a black silty mud with plant fibre mats and crystals of mirabilite. Unit 2 is a grey to green gypsum-rich silt containing calcite-coated twigs and algal fibres. Unit 3 is a black sapropel with abundant aragonite laminae. Overlying this are: Unit 4 (similar to Unit 2) and Unit 5 (similar to Unit 3). Units 3 and 5 represent relatively deep water phases of the lake. In contrast, Units 2 and 4 were deposited during shallow phases. Gypsum and dolomite laminae were likely produced under schizohaline conditions by the periodic influx of relatively dilute-Ca-rich waters. Unit 1 represents deposition in a hypersaline lake with very low water levels and saline mudflats.

The meromixis of Waldsea Lake is primarily ectogenic in nature. Although lake level changes over the past twenty years do not correlate well with rainfall data, drainage diversions and alteration of the peripheral vegetation funnel runoff into the lake. Increased surface runoff and groundwater input has doubled the lake's volume in the last two decades. An initial high salinity and rapid increase in volume with only a small increase in surface area created a relatively stable meromixis. Since 1971 the level of the chemocline has dropped 4 m, suggesting that meromixis is not permanet, and that Waldsea Lake will eventually revert to its previous dimictic state.

1046. SLEZAK, L.A., LAST, W.M., Univ. Manitoba (Earth Sciences):
Sedimentology, geochemistry and near-surface diagenesis in saline playas, the northern Great Plains, 1983-86; M.Sc. thesis (Slezak).

1047. SYVITSKI, J.P.M., Geol. Surv. Can.:
The physical behaviour of suspended particulate matter (spm) in natural aqueous environments, 1981-.

1048. SYVITSKI, J.P.M., Geol. Surv. Can.:
Sedimentology of fjords, 1981-.

1049. TAYLOR, R.B., Geol. Surv. Can.:
Coastal morphology and sediment dynamics, southeast and east Cape Breton Island, Nova Scotia, 1980-.

1050. VILKS, G., Geol. Surv. Can.:
Pleistocene-Holocene basin sedimentation, 1975-.

See:

Late Quaternary stratigraphy of the inner Labrador Shelf; Geol. Surv. Can., Paper 84-1A, p. 57-65, 1984.

Pleistocene-Holocene basin sedimentation, east coast of Canada; ibid., p. 643-646, 1984.

1051. ZAITLIN, B.A., DALRYMPLE, R.W., Queen's Univ. (Geological Sciences):
Comparative sedimentology of sand- and mud-dominated tidal point bars and related deposits in macrotidal estuaries, Cobequid Bay and Cumberland Basin, Bay of Fundy, 1983-87; PH.D. thesis (Zaitlin).

This project will undertake a comparative study of the sand-dominated Cobequid Bay-Salmon/Shubenacadie River Estuaries with the mud-dominated Cumberland Basin, Bay of Fundy, in order to: 1) document the sedimentological processes operating in each estuary; 2) describe the sediment characteristics, organization and temporal changes in the contrasting facies assemblages; 3) determine the Holocene evolution of the systems; 4) define the parameters controlling point bar, bank-attached bar, and "braid bar" in macrotidal settings; and 5) construct comparative transgressive and regressive facies models for the use in the interpretation of similar ancient deposits.

SOIL SCIENCE/PÉDOLOGIE

1052. GREENLEE, G.M., FESSENDEN, R.J., Alberta Research Council (Soils):
Soil survey Provincial Parks, Alberta, 1972-84.

To: 1) classify and map soils in Alberta provincial parks and recreation areas; 2) assess suitability of soil map units for recreation; and 3) compile a soil report for each project area. The foregoing information is used by park planners to determine which soil types are suitable for recreation, and those that should be avoided in designing park areas. The goal is to mimimize park overuse, site deterioration, and overall environmental impact.

1053. HOWITT, R.W., Alberta Research Council (Soils):
Soil interpretations, 1980-85.

To collect base line soil climate data in agricultural areas of the province in order to provide basic data for soil interpretations such as agricultural capability soil erosion, and soil classification. Data is being collected at sixteen stations. The length of record varies from one to five years.

1054. RUITENBERG, A.A., VAN GROENEWOUD, H., McCUTCHEON, S.R., PRONK, A.G., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Soil geology and forest productivity, New Brunswick, 1980-86.

In order to improve forest productivity in New Brunswick, it has become necessary to divide the province's forest land into areas or sites for which productivity for certain species or combinations of species can be predicted. Recent interdisciplinary forest-ecological and soil-geological research has demonstrated that lithologic-mineralogic compositions of tills in New Brunswick show well-defined correlations with forest productivity. Statistical height growth and locally volume growth analyses were done on Black Spruce to measure productivity in different sites.

In the Veneer area of northern New Brunswick, high productivities were found for Black Spruce on soils developed on well-drained basal till predominantly derived from sedimentary rocks of the Matapedia and Grog Brook Groups. Much lower productivity was determined in soils developed on basal tills composed predominantly of sedimentary rocks of the Temiscouata Formation.

In the Mount Pleasant area of southern New Brunswick, soils formed on well-drained basal tills composed predominantly of porphyritic mircrogranite of the Piskahegan Group and sedimentary rocks of the Flume Ridge Formation showed productivities in the same order of magnitude as those in Grog Brook tills in northern New Brunswick. Productivities of soils formed on tills predominantly composed of Seely's Porphyry and Little Mount Pleasant Tuff of the Piskahegan Group were much lower.

1055. RUTHERFORD, G.K., PAWLING, A., VAN LOON, G.W., Queen's Univ. (Geography, Chemistry):
The pedologic properties of iron and uranium oxide tailings, 1982-84.

Samples from older to recent tailings derived from the processing of iron and aluminum oxides at Marmora and Bancroft respectively were examined using normal soil physical chemical and mineralogical analyses. The results were compared with the results from similar anlayses of sulphide ores in the Sudbury Basin. The oxide tailings lacked cemented subsoil horizons common to sulphide tailings; they are less acid and contain considerably less sulphate. In general, sulphide tailings are more favourable growth sites after liming than oxide tailings.

1056. RUTHERFORD, G.K., VAN LOON, G.W., STEWART, R.B., KERN, J., MACKER, D., WESTINBRINK, G., Queen's Univ. (Geography, Chemistry, Microbiology):
The degeneration effects of acid precipitation on two eastern Canadian Forest Soils; 1981-85; Ph.D. thesis (Kern), M.Sc. theses (Macker, Westinbrink).

See:

Determination of chloride, nitrate, sulphate and total sulpur in environmental samples by single-column ion chromatography; Talanta, vol. 30, no. 9, p. 677-682, 1983.

Field sites and reconstituted soil profiles in the laboratory are/were leached with simulated acid precipitation. Samples of leachates from several depths in the field laboratory were subjected to chemical and microbiological analyses. Soil samples from various depths were analysed before and after leaching using pedological and microbiological techniques. Normal accelerated and intensive leaching rates were simulated as well as a freeze/thaw cycles. Microbiologically sterile and neutral columns were leached. Preliminary results suggest that pH 3.7 and 3.5 solutions exercise only modest effects on soil chemical properties but microbiological reactions change substantially at ph <45.

1057. WELLS, R.E., NIKIFORUK, W.L., Alberta Research Council (Soils):
Soil survey - County of Paintearth, Alberta, 1981-85.

Soil survey of the County of Paintearth was initiated at 1:50 000 scale as a result of a request by Alberta Agriculture for better information to determine the location and extent of problem soils. Variable results of deep plowing tests in solonetzic soils and presence of strongly acid surface soils throughout the County were the main factors prompting this request. Map units are rated in terms of their major soil components as suitable, marginal, or unsuitable for deep tillage. Routine pH determinations are being carried out during the survey to characterize surface soil acidity across the County. Project is now two-thirds completed.

PRECAMBRIAN/PRÉCAMBRIEN

1058. AITKEN, J.D., Geol. Surv. Can.:
Helikian and Hadrynian stratigraphy Eastern Cordilleran and Interior Platform, 1973-.

1059. BARRETT, T.J., FRALICK, P.W., Univ. Toronto (Geology):
Stratigraphic, sedimetonlogical and geochemical characteristics of Precambrian banded iron formations in western Ontario, 1982-85.

Field relationships indicate that lateral and vertical facies changes between BIF and associated sandstone/conglomerate units can be rapid. The project concentrates on litho-facies analysis and dispersal patterns of clastic material into the chemical sediment basin, and on the origin of the fine-scale layering. Isotope and trace element studies will be carried out in the future on thin bands of chemical sediment separated from the BIF. Future field work will examine neighbouring (but contrasting) Algoma-type BIFs, and also the Superior-type BIF (no associated volcanics) at Steep Rock.

1060. CAMPBELL, F.H.A., Geol. Surv. Can.:
Geology of the Coronation Gulf area, District of Mackenzie, 1977-.

1061. CAREY, J.A., SIMONY, P.S., McMECHAN, M.E., Univ. Calgary (Geology and Geophysics):
Structure, stratigraphy and metamorphism of the Late Proterozoic Miette group, Cushing Creek area, British Columbia, 1982-84; M.Sc. thesis (Carey).

See:

Structure and stratigraphy of the Late Proterozoic Miette Group, Cushing Creek area, Rocky Mountains, British Columbia; Geol. Surv. Can., Paper 86-1A, p. 425-428, 1986.

The Late Proterozoic Miette Group comprises three units in the Rocky Mountains, near McBride, British Columbia. Black slate, dark grey limestone and calcareous grits characterize the lower Miette, which is greater than 380 m thick. The 2870 m thick middle Miette is made up of interlayered sandstone to grit units and slate units. Slates dominate the upper Miette, which has an estimated thickness of 1800 m. The Miette Group is disconformably overlain by lower Cambrian quartzites. Deposition is interpreted to have occurred in a marine setting varying from relatively deep marine (lower Miette), to submarine fan (middle Miette) to relatively shallow shelf (upper Miette). Middle and upper Miette strata form a homocline on the west limb of a major anticline which is cored by complexly deformed lower Miette strata. A penetrative slaty cleavage parallels minor folds, and has a southwesterly dip, except in the westernmost part of the area, where it has been rotated by faulting and late folding and dips to the northeast. Two distinct crenulations cleavage sets are locally developed.

1062. CHANDLER, F.W. Geol. Surv. Can.:
Geology of the Helikian sediments and adjacent gneisses, Fury and Hecla Strait area, District of Franklin, 1979-.

1063. EISBACHER, G.H., Geol. Surv. Can.:
Stratigraphy, sedimentation, structure and tectonic setting of the Windermere Supergroup, 1979-.

1064. HENDERSON, J.R., Geol. Surv. Can.:
Geology of the Foxe Fold belt (East half), Baffin Island, District of Franklin, 1979-.

1065. HOCQ, M., IMREH, L., Québec Ministère Énergie et Ressources:
Projet de cartographie géologique Joutel-Quévillon, Québec, 1980-86.

Voir:

Joutel-Quévillon, Région de la Rivière Gale; Québec Ministère Énergie et Ressources, Rapport ET. 82-01, p. 207-250, 1983.

Pour 1983: Carte préliminaire annotée DP-83-25; Cantons de Dalet et Mazarin (Abitibi-Est). Rédaction du rapport final des l'automne 1984.

1066. HOFFMAN, P.J., Geol. Surv. Can.:
Hepburn batholith, Hepburn Lake map area, District of Mackenzie, 1977-.

1067. JACKSON, G.D., Geol. Surv. Can.:
Operation Borden, District of Franklin, 1977-.

1068. ROOT, K.G., SIMONY, P.S., Univ. Calgary (Geology and Geophysics):
Geology of the Delphine Creek-Jumbo Creek area, southeastern British Columbia, 1982-85; Ph.D. thesis (Root).

See:

Upper Proterozoic and Paleozoic stratigraphy, Delphine Creek area, southeastern British Columbia: implications for the Purcell Arch; Geol. Surv. Can., Paper 83-1B, p. 377-380, 1983.

Focus on the stratigraphy and sedimentation of the Middle Proterozoic to Upper Devonian stratigraphic succession, the relationship between tectonics and sedimentation, and on the Mesozoic structure of the Purcell Anticlinorium. Field studies in 1983 established that thickness and facies variations in the Upper Proterozoic Toby Formation were controlled by activity on west-side-down normal faults. Later displacement on these faults exerted important controls on sedimentation during deposition of the Horsethief Creek Group and Devonian strata.

1069. SIMARD, A.S., ROY, C., Univ. Montréal (Géologie), Quebec Ministère Énergie et Ressources:
Stratigraphie et volcanisme dans la région Frotet-Troilus, bande Frotet-Evans, Québec, 1978-85; Ph.D. thesis (Simard).

Voir:

Stratigraphie de la région ds lacs Frotet et Troilus, Bande Frotet-Evans; Québec Ministère Énergie et Ressources, DV 83-11, p. 83-91, 1983.

Lithostratigraphic préliminaire de la Partie Est de la Bande Volcano-Sédimentaire, Archéenne Frotet-Evans; ibid., ET 82-01 p. 163-176, 1983.

Altération hydrothermale des basaltes du lac Troilus; ibid., ET 82-01, p. 177-188, 1983.

1070. WALLACE, H., Ontario Geol. Surv.:
Geology of the Red Lake area, northwestern Ontario, 1979-85.

A tectono-stratigraphic model for the Red Lake belt is being prepared based on several man-years of detailed geological mapping combined with U/Pb zircon geochronology, lithogeochemistry, and recent structural analysis. This information taken with a compilation of this regions gold deposits is leading to the development of a comprehensive metalogenetic scheme applicable not only to the Red Lake area but other parts of the Uchi Subprovince where similar stratigraphy and structural features have been observed.

1071. WHEATLEY, K., HENDRY, H.E., Univ. Saskatchewan (Geological Sciences):
Stratigraphy and sedimentology of the Carswell Dolomite, Saskatchewan, 1982-84; M.Sc. thesis (Wheatley).

The Carsewell Dolomite (Proterozoic) of northern Saskatchewan is composed of stromatolites, algal laminites, doloru dites, dolomicrites, oolites, and oncolitic beds. The formation is badly faulted and folded but its thickness is estimated to be about 500 m. The sediments accumulated in a shallow marine environment subject to periodic desiccation. During deposition, collapse of beds as a result of evaporite dissolution and tectonic deformation caused coarse-grained breccia dikes and sills to form. The Carswell circular structure developed about 480 uc when the dolomites were faulted and folded with overturning of beds towards the outside of the ring.

STRATIGRAPHY/STRATIGRAPHIE

1072. YEO, G.M., YOUNG, G.M., PADGHAM, W.A., Univ. Western Ontario (Geology):
Relevance of the Rapotan Group to the association of iron-formation and glacial deposits in the late Proterozic, 1975-84; Ph.D. thesis (Yeo).

PALEOZOIC/PALÉOZOIQUE

1073. AITKEN, J.D., Geol. Surv. Can.:
Lower Paleozoic stratigraphy, southern Rocky Mountains, Alberta and British Columbia, 1972-.

1074. AMYOT, G., BRISEBOIS, D., Québec Ministère Énergie et Ressources:
Cartographie de la région de Bonnécamp, Québec, 1983-84.

Cartographie géologique régionale dans le cadre de la révision de la carte du Silurien et du Dévonien de l'Est de la Gaspésie.

1075. BOLTON, T.E., Geol. Surv. Can.:
Silurian-Ordovician macrobiostratigraphy of Anticosti Island, Québec, 1974-.

1076. BRISEBOIS, D., Québec Ministère Énergie et Ressources:
Région de Fletcher, Québec, 1983-84.

Projet de cartographie régional du Silurien et du Dévonien de la Gaspésie. Ce projet fait suite aux travaux de cartographie réalisés depuis 1978 dans la région de Gaspé.

1077. CECILE, M.P., Geol. Surv. Can.:
Lower Paleozoic basin-to-platform relationships in the Cordillera, District of Mackenzie – British Columbia-Yukon, 1977-.

See:

The isotope composition of western Canadian barites and the possible derivation of oceanic sulphate $\delta^{34}S$ and $\delta^{18}O$ age curves; Can. J. Earth Sci., vol. 20, no. 10, p. 1528-1535, 1983.

Origin of radioactive barite sinter, Flybe springs, Northwest Territories, Canada; Can. J. Earth Sci., vol. 21, no. 4, p. 383-395, 1984.

1078. CHRISTIE, R.L., Geol. Surv. Can.:
Geological reconnaissance, southeastern margin of Franklinian geosyncline, 1980-.

1079. DANNER, W.R., Univ. British Columbia (Geological Sciences):
Stratigraphy and micropaleontology of late Paleozoic-Triassic suspect terranes in southwestern British Columbia and adjacent parts of Washington State, U.S.A., 1966-.

Continued field and laboratory work on limestones of the Kamloops area (Harper Ranch-Dome Hills). Discovered new areas of late Mississippian limestones and a previously unknown Jurassic plant-bearing sequence. Kamloops part of project should be mostly completed in 1984 except for detailed descriptions of fusulines and algae. Work to continue as time and funds permit on Cache Creek, Chilliwack, Blink Creek, Shoemaker Creek and Sicker limestones.

1080. DESROCHERS, A., JAMES, N.P., PETRYK, A.A., Memorial Univ. (Earth Sciences), Québec Ministère Énergie et Ressources:
Lithostratigraphie et sédimentologie des Îles de Mingan, Québec, 1982-83; thèse de doctorat (Desrochers).

Voir:

Secteur Est de l'Archipel de Mingan; Québec Ministère Énergie et Ressources, DP 83-23, 1984.

Géologie du Secteur Ouest des Îles de Mingan; ibid., DP 83-04, 1984.

Établir une carte des lithofaciès des Îles de Mingan. Comparer avec les autres séquences équivalentes des Appalaches. La moitié de la carte a été effectuée en 1982, l'autre moitiée a été complétée en 1983. Vérification et études des cartes 1984.

1081. FRITZ, W.H., Geol. Surv. Can.:
Cambrian biostratigraphy of the Canadian Cordillera, 1965-.

See:

Strata and trace fossils near the Precambrian-Cambrian boundary, Mackenzie, Selwyn, and Wernecke Mountains, Yukon and Northwest Territories; Geol. Surv. Can., Paper 83-1B, p. 365-375, 1983.

1082. GELDSETZER, H.H.J., Geol. Surv. Can.:
Carboniferous and Triassic strata of Appalachian region, 1974-.

1083. GELDSETZER, H.H.J., Geol. Surv. Can.:
Middle and Upper Devonian rocks of east-central British Columbia and west-central Alberta, 1979-.

1084. HOWIE, R.D., Geol. Surv. Can.:
Compilation of geoscientific data in the Upper Paleozoic basins of southeastern Canada, 1971-.

1085. ING, A., HARRISON, R.S., Alberta Research Council (Geol. Surv.):
Stratigraphy of Upper Devonian Woodbend Group, northern Alberta, 1983-84.

To delineate the northern extension of the Rimbey-Meadowbrook Reef Trend and to document the inter-relationship between this Trend, the underlying Cooking Lake Platform, and the overlying Grosmont Formation.

1086. IRRINKI, R.R., CROUSE, G.W., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Geology of Sisson Branch Reservoir map area, NTS 21O/6, New Brunswick, 1983-84.

1087. KNIGHT, I., Newfoundland Dept. Mines and Energy:
Geological mapping of Cambro-Ordovician platformal rocks, Northern Peninsula, Newfoundland, 1976-85.

The remaining two years will see the completion of all map sheets underlain by Cambro-Ordovician platformal rocks on the Northern Peninsula of Northwest Newfoundland. Stratigraphic and mapping problems will be identified after 1984 and hopefully resolved in 1985. Complete documentation of the results of the mapping program will then appear in a memoir.

1088. LACHAMBRE, G., BOURQUE, P.-A., SKIDMORE, W.B., Univ. Laval (Géologie), Québec Ministère Énergie et Ressources:
Stratigraphie du groupe de Chaleurs, nord-ouest de la Gaspésie, Québec, 1981-85.

Levé de base complété. Vérification et synthèse à faire 1984-85.

1089. LARSSON, S.Y., STEARN, C.W., McGill Univ. (Geological Sciences):
Stratigraphy and paleontology of the Silurian rocks of the Hudson Bay Lowland in eastern Quebec, 1982-84; M.Sc. thesis (Larsson).

See:

Shallow water Silurian sedimentary rocks of northwestern Quebec; Geol. Soc. Amer., Program with Abstracts, vol. 15, p. 186, 1983.

1090. MAYR, U., Geol. Surv. Can.:
Paleozoic stratigraphy of central and southern Ellesmere Island and northern Devon Island, District of Franklin, 1981-.

1091. McCUTCHEON, S.R., RUITENBERG, A.A., New Brunswick Dept. Nat. Res. (Mineral Res. Div.):
Geology, geochemistry and mineralization of the Mount Pleasant Caldera, southwestern New Brunswick, 1982-85.

The pre-middle Viséan Piskahegan Group, host rocks to the Mount Pleasant Caldera, is divisible into intra- and exo-caldera sequences. The intra-caldera sequence is further divisible as to whether the rocks are pre- or post-mineralization and alteration. The exo-caldera sequence from base upward consists of interbedded mafic lavas and felsic pyroclastics, a fining upward red bed unit, and felsic pyroclastics, and is best developed to the east in the Mill Settlement area. Post-mineralization caldera-fill rocks comprising felsic pyroclastics, conglomerate and mafic lava lie along the northern edge of the triangular "Ms Unit" on the geologic map of New Brunswick. Pre- to syn-mineralization rocks comprising interbedded mafic lavas and sharpstone conglomerate, felsic pyroclastics, and intrusive porphyries occupy over three-quarters of the same triangular "Ms Unit". A tentative correlation has been made between the rocks in the exo-caldera and pre- to syn-mineralization sequences but it remains to be verified by petrographic and chemical data.

1092. MEIJER-DREES, N.C., Geol. Surv. Can.:
Middle and Upper Devonian rocks in the subsurface of west-central Alberta, 1981-.

1093. MORROW, D.W., Geol. Surv. Can.:
Stratigraphy, sedimentology and diagenesis of Paleozoic rocks in the Mackenzie Mountains and northern Rocky Mountains, Yukon Territory, 1975-.

1094. NASSICHUK, W.W., Geol. Surv. Can.:
Stratigraphy and paleontology of Upper Paleozoic rocks on Ellesmere and Axel Heiberg Islands, District of Franklin, 1968-.

1095. NORFORD, B.S., Geol. Surv. Can.:
Ordovician and Silurian biostratigraphy of British Columbia, Alberta, Manitoba, Yukon, Mackenzie and Franklin, 1961-.

1096. NORRIS, A.W., Geol. Surv. Can.:
Devonian biostratigraphy of the northern Yukon Territory and adjacent District of Mackenzie, 1975-.

1097. PACKARD, J.J., DIXON, O.A., Univ. Ottawa (Geology):
Upper Silurian Barlow Inlet Formation of Cornwallis Island, Arctic Canada, 1977-84; Ph.D. thesis (Packard).

1098. PEDDER, A.E.H., Geol. Surv. Can.:
Upper Silurian and Devonian biostratigraphy western and northern Canada, 1968-.

See:

A new Zlichovian (Early Devonian) species of the rugose coral genus **Zelolasma** from the Eids Formation of Ellesmere Island, Northwest Territories; Geol. Surv. Can., Paper 83-1B, p. 195-200, 1983.

New Dalejan (Early Devonian) rugose corals from the Blue Fiord Formation of southwestern Ellesmere Island, Northwest Territories; ibid., p. 223-236, 1983.

New Devonian rugose corals of probable late Dalejan age from the Bird Fiord Formation of southwestern Ellesmere Island, Northwest Territories; ibid., p. 335-352, 1983.

Devonian rugose coral biostratigraphy with special reference to the Lower-Middle Devonian boundary; Geol. Surv. Can., Paper 84-1A, p. 449-452, 1984.

1099. POEY, J.-L., DIXON, O.A., Univ. Ottawa (Geology):
Carbonate facies of the Silurian shelf-to-basin transition, Baumann Fiord area, Ellesmere Island, 1981-84; M.Sc. thesis (Poey).

1100. PURDY, D., HARRISON, R.S., Alberta Research Council (Geol. Surv.):
Regional subsurface study, Nisku Formation, central Alberta, 1983-84.

A regional examination of the Nisku Formation and documents in detail the carbonate platform-to-basin transition in the West Pembina area.

1101. RHÉAULT, M., BRISEBOIS, D., Québec Ministère Énergie et Ressources:
Cartographie de la région de Murdochville, Québec, 1983-84.

Cartographie géologique régionale dans le cadre de la révision de la carte duSilurien et du Dévonien de l'Est de la Gaspésie.

1102. RICHARDS, B.C., Geol. Surv. Can.:
Carboniferous stratigraphy and sedimentology of northeastern British Columbia and northwestern Alberta, 1981-.

1103. ROUILLARD, M., LESPÉRANCE, P.J., BRISEBOIS, D., Univ. Montréal (Géologie), Québec Ministère Énergie et Ressources:
Stratigraphie des Calcaires Supérieurs de Gaspé, Québec, 1981-83; thèse de doctorat (Rouillard).

Etude stratigraphique et sédimentologique des Calcaires Supérieurs de Gaspé.

1104. SANFORD, B.V., Geol. Surv. Can.:
Lower Paleozoic geology of Eastern Canada, 1975-.

1105. SINTHUSAN, A., MOORE, R.G., Acadia Univ. (Geology):
Biostratigraphy of the Wallace Point Limestone Member, Nova Scotia, 1984-85; M.Sc. thesis (Sinthusan).

1106. SLIVITZKY, A., BIRON, S., Québec Ministère Énergie et Ressources:
Cambro-ordovicien du NE de la Gaspésie, Québec, 1981-84.

Etablir la carte géologique des roches cambro-ordoviciennes du NE de la Gaspésie.

1107. THOMPSON, R.I., Geol. Surv. Can.:
Structure and stratigraphy of Paleozoic and lower Mesozoic rocks in Halfway River map-area, northeastern British Columbia, 1975-.

1108. WALKER, D., HARRISON, R.S., Alberta Research Council (Geol. Surv.):
Stratigraphy of Grosmont Formation, northern Alberta, 1983-84.

To document the areal extent of the Grosmont Formation, affirm the presence of four regionally correlatable internal stratigraphic subdivisions, and to delineate the stratigraphic relationships between the Grosmont and adjacnet Ireton basin fill.

1109. WILLIAMS, H., Memorial Univ. (Earth Sciences):
Stratigraphy and tectonics of Humber Arm Allochthon, Newfoundland, 1978-87.

See:

Humber Arm Allochthon at South Arm Bonne Bay, western Newfoundland; Geol. Surv. Can., Paper 83-1A, p. 179-182, 1983.

Geology of Lomond map area, Newfoundland; Geol. Surv. Can., Paper 84-1A, p. 157-164, 1984.

Approximately 80% of the Humber Arm Allochthon and nearby autochthonous rocks has been mapped and studied. The remaining area, mainly north of Bonne Bay, should be completed in 1984, 1985. Other areas need checking, sharpening and up dating; all leading to complete coverage of the allochthon by 1987.

MESOZOIC/MÉSOZOIQUE

1110. ASCOLI, P., Geol. Surv. Can.:
Biostratigraphic zonation (Formanifera-Ostracoda) of the Mesozoic and Cenozoic rocks of the Atlantic Shelf, 1971-.

1111. BARRETT, T.J., LEGGETT, J.K., ROBERTSON, A.H., FRIEDRICHSEN, H., Univ. Toronto (Geology):
Stratigraphic and geochemical aspects of two unusual ophiolite complexes: East Liguria, Italy and Ballantrae, Scotland, 1981-85.

Stable isotopic data for the East Liguria basalts suggests significant $\delta^{18}O$-enrichment relative to fresh MORB due to secondary low-temperature smectitic phases. Serpentinization is estimated to have occurred at temperatures of some 130 to 240°C. Quartz/calcite veins cutting the ophiolitic rocks are inferred to have formed at temperatures of 77 to 145°C, apparently after the highest sub-seafloor temperatures had been attained by the host rocks.

The Ballantrae ophiolite, on the other hand, is viewed mainly as a volcanic edifice, either an aseismic ridge or seamount, with only very limited amounts of typical MORB. We suggest that the relative topography of this edifice led to its preferential obduction (rather than subduction) to the north of the southern uplands accretionary wedge.

1112. CHRISTOPHER, J.E., Saskatchewan Geol. Surv.:
The Lower Cretaceous Mannville Group of Saskatchewan, 1975-.

On-going study of stratigraphy, sedimentation controls and tectonic history of the Kimmeridgian to Albian strata in Saskatchewan and contiguous regions.

1113. DIXON, J., Geol. Surv. Can.:
Geology of the Beaufort-Mackenzie Basin, 1979-.

1114. EMBRY, A.F., Geol. Surv. Can.:
Mesozoic stratigraphy and basin analysis of the Sverdrup Basin, Arctic Archipelago, 1975-.

See:

Stratigraphic subdivision of the Heiberg Formation, eastern and cental Sverdrup Basin, Arctic Islands; Geol. Surv. Can., Paper 83-1B, p. 205-213, 1983.

The Heiberg Group, western Sverdrup Basin, Arctic Islands; ibid., p. 381-389, 1983.

1115. GIBSON, D.W., Geol. Surv. Can.:
Stratigraphic and sedimentological studies of Lower Cretaceous rocks, Rocky Mountains Foothills and Front Ranges, Alberta and British Columbia, 1975-.

1116. GIBSON, D.W., Geol. Surv. Can.:
Stratigraphy and sedimentology of the Lower Cretaceous Gething Formation, Rocky Mountain Foothills, Alberta and British Columbia, 1979-.

1117. JANSA, L.F., Geol. Surv. Can.:
Reconnaissance field study of the Mesozoic sequences outcropping on the Iberian Peninsula, 1977-.

1118. POULTON, T.P., Geol. Surv. Can.:
Jurassic biostratigraphy of selected areas of western and Arctic Canada, 1976-.

1119. PRICE, L.L., Geol. Surv. Can.:
Upper Cretaceous-Tertiary geology of Tuktoyaktuk Peninsula and adjacent areas, District of Mackenzie, 1983-.

1120. STOTT, D.F., Geol. Surv. Can.:
Jurassic and Cretaceous Minnes Group, Alberta and British Columbia, 1978-.

1121. STOTT, D.F., Geol. Surv. Can.:
Syntheses of Mesozoic and Cenozoic rocks of eastern Cordillera and Plains, 1981-.

1122. STRUIK, L.C., Geol. Surv. Can.:
Stratigraphy and tectonics of the western margin of the southern Omineca Belt, British Columbia, 1982-.

See:

Stratigraphy of Quesnel Terrane near Dragon Lake, Quesnel map area, central British Columbia; Geol. Surv. Can., Paper 84-1A, p. 113-116, 1984.

1123. TEMPELMAN-KLUIT, D.J., Geol. Surv. Can.:
Stratigraphy, structure and metallogeny of the northern part of the Intermontane Belt (Whitehorse trough) in the Canadian Cordillera, 1977-.

1124. TIPPER, H.W., Geol. Surv. Can.:
Biostratigraphic study of Mesozoic rocks in the Intermontane and Insular Belts of the Canadian Cordillera, 1975-.

See:

Lower and Middle Jurassic sediments and volcanics of the Spatsizi map area, British Columbia; Geol. Surv. Can., Paper 84-1A, p. 117-120, 1984.

The age of the Jurassic Rossland Group of southeastern British Columbia; ibid., p. 631, 632, 1984.

1125. WADE, J.A., Geol. Surv. Can.:
Regional subsurface geology of Mesozoic and Cenozoic rocks of the Atlantic continental margin, 1972-.

CENOZOIC/CÉNOZOIQUE

1126. MIALL, A.D., Univ. Toronto (Geology):
Cenozoic stratigraphic and tectonic evolution of the Canadian Arctic Islands, 1973-85.

A tectonic model has been developed for the Eurekan Orogeny that incorporates marine geophysial evidence of sea floor spreading in Baffin Bay-Labrador Sea. Stratigraphic studies show that Late Cretaceous to Oligocene clast wedges in Ellesmere and Axel Heiberg Islands developed in response to specific, localized pulses of tectonic activity. Sediment was deposit in a variety of fluvial, deltaic and shallow marine environments.

1127. YORATH, C.J., Geol. Surv. Can.:
The Canadian Pacific continental margin, 1977-.

ALBERTA/ALBERTA

1128. BEATTIE, E.T., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
The effect of facies variation on the style of deformation, Ram Range, Alberta, 1982-84; M.Sc. thesis (Beattie).

See:

Facies control of fold geometry, central Front Ranges, Alberta; Can. Tectonics Group Third Annual Meeting Abstracts, J. Structural Geol., 1984.

Structural/stratigraphic traps in the Upper Devonian Fairholme Group: a new prospect in the Rockies; Western Inter-Univ. Geol. Convention Abstracts, Calgary, 1984.

Comparison of folds within the Bare thrust sheet in the central Alberta Front Ranges shows that their geometry changes from a more parallel style in the southeast to a more similar style in the northwest. Between these two areas the carbonate rocks of the Devonian Fairholme Group undergo a facies transition from biostromal dolomite grainstones and dolomitic arenites in the south to calcareous shales in the north. The Palliser, Banff, and Pekisko formations, above the Fairholme, remain relatively constant in lithology and stratigraphic thickness across the Fairholme facies change. However, the fold style of these units changes demonstrably, indicating that they are profoundly affected by the underlying strata. Besides introducting the similar fold style into the "Foothills family" of structures, this study also shows that the thickness of the dominant member (i.e. the Palliser formation), is not necessarily the principle factor controlling the geometry of the folds.

1129. DWYER, M.K., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
The geometry and mechanical development of the Livingstone Thrust Fault and overlying structures, Livingstone River,Alberta, 1983-85; M.Sc. thesis (Dwyer).

The Livingstone thrust fault is characterized by a folded surface. The structures overlying the thrust plane are developed differently in Paleozoic carbonates and Mesozoic clastics. It appears that the competency of these units has influenced the style of deformation.

In this study, field data will be collected and geometrical methods will be used to synthesize the information. Through a variety of techniques the geometry of the structural features, particularly the thrust faults, will be determined. Determination of the hangingwall geometry and shape of the Livingstone thrust surface will necessarily place constraints on the interpretation of underlying structures. A strain history obtained by the orientation of mesoscopic features should characterize the mechanical behavior of the units as well as establish relative age relationships between structural features.

In this fashion, the relative timing and mechanism(s) which produced the folding of the Livingstone thrust surface may be inferred and the sequence of deformational events which have affected the area will be determined.

1130. LANGENBERG, C.W., Alberta Research Council (Geol. Surv.):
Structural geology of coal measures, Alberta, 1981-85.

1131. MAUREL, L.E., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
Structure and stratigraphy of the McConnell thrust sheet at Barrier Mountain, Kananaskis, Alberta, 1982-86; Ph.D. thesis (Maurel).

Barrier Mountain displays a complex assemblage of thrust faults repeating formations which are Cambrian to Mississippian in age. The delineation of the McConnell Thrust is not shown consistently on the various earlier maps due to changes in both the stratigraphic nomenclature and the positioning of folds and faults. We are establishing the geometric relationships between faults and the sequence of faulting using newly developed principles, especially those of Boyer and Elliott (1982). Mapping in the Kananaskis Valley is being done at a scale of 1:10 000. Microtectonic analysis, computer data processing, and observation of thin sections showing associated microfracturing, strain, dissolution and recrystallization, will be the main methods used to refine the chronology of events, both folding and faulting, affecting the numerous imbricate sheets. Confusion still persists in the nomenclature of stratigraphic formations in the area because of the cut-off and shearing of units produced by intense faulting, and because of facies changes within the formations. A meticulous stratigraphic analysis of the formations defined by the measuring and correlation of lithologic sections will be undertaken before any kind of strutural interpretation can be made. The results will be shown in balanced cross sections, 'in series' cross sections along the whole range, and longitudinal sections; they will be supported by hangingwall sequence diagrams, stratigraphic separation diagrams, and palinspastic maps.

1132. RIGGERT, V.L., SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
The geometry and mechanical development of the Heart Mountain thrust stack, Exshaw, Alberta, 1982-83; M.Sc. thesis (Riggert).

Heart Mountain forms a peculiar localized thrust stack along the otherwise relatively linear Exshaw Thrust trace in the Front Ranges of the Canadian Rockies. Data from stratigraphic and structural mapping were used in the construction of balanced cross sections, longitudinal sections, and stratigraphic separation diagrams to reveal the true three-dimensional geometry of the mountain. The structure (the "heart") is composed of an allochthonous canoe-shaped body of rock that plunges gently to the south. Near its southern termination, however, the heart plunges steeply to the north.

Several previously unrecognized features of the Heart Mountain structure were discovered during mapping. The heart is a faulted syncline with its east limb thrust up relative to its west limb. The heart's "collar" is composed of the Loomis Member of the Viséan Mount Head Formation, not the Tournaisian Livingstone Formation as previously mapped. The panel of Livingstone rocks west of the heart is stratigraphically up to the east and is in thrust contact with the west collar of the heart, also stratigraphically up to the east. Based on both stratigraphic and structural considerations, the thrust stack formed in an east-to-west sequential development from rock panels of relatively local origin.

1133. SPRATT, D.A., Univ. Calgary (Geology and Geophysics):
Deformation mechanisms associated with the growth and emplacement of thrust sheets, southwestern Alberta, 1980-85.

See:

Deformation mechanisms associated with the initiation and propagation of thrust faults; EOS Trans., Am. Geophysical Union, vol. 64, p. 318, 1983.

The Foreland Thrust belt of the Southern Canadian Rockies contains a wealth of oil and gas reservoirs, yet the details of the structural evolution of the thrust belt are not completely understood. The mechanics of evolution are being quantitatively analysed for the following stages of development: a) the localization, initiation, and propagation of individual thrust faults; b) the emplacement and internal deformation of eastward moving thrust sheets; and c) folding of thrust sheets by later movement on underlying faults.

This research indicates that the creation of the fault surface is a problem of ductile or semi-brittle fracturing; investigation of the areas around the tips of well exposed thrust faults aids in the description of the mechanics of fracture. Emplacement of a thrust sheet sets up a finite strain field within the sheet; correlation of this finite strain with the physical mechanisms which caused it is providing a guide to the overall stress – strain rate response of the thrust sheet. Additional strain within a thrust sheet is the result of folding as an underlying sheet moves up a ramp. Completed field work indicates that during the evolution of a thrust belt, different deformation mechanisms occur in different regions. We find: zones of intense fracturing, ductile deformation zones, pressure solution cleavage in fold hinge regions, and vein filling in tensile regions. By separating out the effects due to each stage of development, we can begin to understand how the porosity and permeability of the rock can be locally altered by deformation.

1134. SPRATT, D.A. Univ. Calgary (Geology and Geophysics):
Structure and stratigraphy of the Sulphur Mountain thrust sheet, Kananaskis Range, Alberta, 1984-86.

The Geological Survey of Canada has only mapped the Kananaskis and Spray Lakes Valleys at a scale of 1:50 000 north of 51° latitude. Although the Sulphur Mountain thrust sheet is a very simple structure at Sulphur Mountain in Banff National Park, south of 51° latitude the structure becomes much more complex. Recent road construction on the Spray Lakes and Smith Dorian trails has opened this area to detailed field mapping. Of particular interest in this study is a highly imbricated thrust stack of Devonian through Cretaceous rocks on Mount Engadine. Reconnaissance mapping (1:126 720) by the GSC indicates that both hangingwall and footwall imbricates have been developed in this one locality; this is an uncommon phenomenon in the Front Ranges and one which has never been studied in detail. The Sulphur Mountain thrust sheet will be mapped at a scale of 1:100 000 from 51° latitude southward to its termination east of Kananaskis Lakes. An understanding of the geometric evolution of the sheet will be deduced from the construction of balanced cross sections, longitudinal sections, hangingwall sequence diagrams, stratigraphic separation diagrams and palinspastic maps.

BRITISH COLUMBIA/ COLOMBIE-BRITANNIQUE

1135. BROWN, R.L., Carleton Univ. (Geology):
Structural and tectonic investigations in the Canadian Cordillera, 1972-.

See:

Shuswap terrane of British Columbia: A Mesozoic "Core Complex"; Geology, vol. 11, p. 164-168, 1983.

To contribute to the advancement of knowledge in the Earth Sciences and has direct application to mineral exploration and engineering projects in southeastern British Columbia. Domal metamorphic terranes (core complexes) are known along the length of the North American Cordillera and are characteristic features of orogenic belts throughout the world, but their tectonic signifiance remains uncertain and controversial. The Shuswap terrane of the southern Omineca belt is the largest and best exposed of the domal terranes; its interpretation is essential to a tectonic synthesis of the Cordillera.

1136. CAMPBELL, R.B., Geol. Surv. Can.:
Geology of the Cariboo Mountains, British Columbia, 1968-.

1137. CORBETT, C.R.R., SIMONY, P.S., Univ. Calgary (Geology and Geophysics):
A structural analysis of the Champion Lake Fault zone near Trail-Castlegar in southeastern British Columbia, 1983-84; M.Sc. thesis (Corbett).

See:

The Champion Lake Fault in the Trail-Castlegar area of southeastern British Columbia; Geol. Surv. Can., Paper 84-1A, p. 103-104, 1984.

the Champion Lake Fault strikes northward from the east side of Trail, follows the most westerly of the Champion Lakes and can be traced beyond Castlegar where it turns northeastward. It has a steep easterly dip in the 60° to 80° range; its width is a function of the lithologies through which it cuts. The fault zone is widest (up to 600 m) in the Trail and Bonnington plutons. The dominant lithologies in the fault zone are breccia and microbreccia with chlorite, epidote, quartz, calcite and hematite. Protomylonite is rare. The juxtaposition of higher and deeper levels of the plutons and of stratigraphy cut by the fault suggest a minimum displacement of 1-2 km. The Champion Lake Fault cuts mid-Jurassic plutons and some, but not all, members of an Eocene (?) dyke swarm.

1138. DECHESNE, R.G., SIMONY, P.S., GHENT, E.D., Univ. Calgary (Geology and Geophysics):
Metamorphism and structural evolution of the southern Cariboo Mountains, British Columbia, 1982-84; M.Sc. thesis (Dechesne).

See:

Structural evolution and metamorphism of the southern Cariboo Mountains near Blue River, British Columbia; Geol. Surv. Can., Paper 84-1A, p. 91-94, 1984.

Geologic mapping and sampling at a scale of 1:24 000 was carried out during the summers of 1982 and 1983 in the southern Cariboo Mountains near Blue River, British Columbia. Three phases of deformation have affected these sillimanite-grade rocks. The first deformation produced tight to isoclinal folds overturned to the southwest, and a penetrative foliation due to the alignment of micas. The second deformation; tight folds associated with a thrust fault in the Thunder River Valley. This fault has about 2.5 km stratigraphic throw. The foliation produced during this deformational event ranges from a tight crenulation of the phase one foliation to a penetrative schistosity which obliterates any evidence of an earlier foliation. All of these structures are northeast verging. The peak of metamorphism occurred late in the second phase of deformation, reaching sillimanite plus migmatite conditions throughout most of the area. The post-metamorphic third phase of deformation produced upright open folds and warps that fold the earlier structures, including the second phase thrust fault. Open crenulations are assocaited with these late structures. The metasedimentary rocks are tentatively correlated with the uppermost Horsethief Creek Group and the lowermost Kaza Group, both of which are Precambrian clastic-dominated sequences.

1139. GERASIMOFF, M.D., DIXON, J.M., HELMSTAEDT, H., STRUIK, L.C., Queen's Univ. (Geological Sciences):
Structure, stratigraphy, and the relationship of the Cariboo Terrane (Kaza and Cariboo groups) to the Barkerville Terrane (Snowshoe Group and ? Horsethief Creek Group), 1983-1987; M.Sc. thesis (Gerasimoff).

The thesis is a combined stratigraphy, structure and isotopic age-dating study of Precambrian and Cambrian sedimentary rocks of the Kaza and Cariboo groups (Cariboo Terrane). These groups lie to the west of the Rocky Mountain Trench north of the Thompson River and east of a line from Bowron River to Penfold Creek. They overlie the Horsethief Creek Group to the south and the Barkerville Terrane (composed of the Snowshoe Group) at Barkerville and Quesnel Lake.

Struik has proposed (not formally) that the Cariboo Terrane is everywhere thrust onto underlying units such as the Horsethief Creek and Snowshoe groups. It is clearly thrust onto the Snowshoe Group at Quesnel and Hobson lakes. Mapping by Struik in the summer of 1983 at Quesnel Lake has suggested that there is a sequence of faults that are located at the boundary between the Cariboo and Barkerville Terranes. The time sequence of faults is part of a fault zone that penetrates the two terranes. Faults mapped by Campbell within the Cariboo Terrane of Quesnel Lake and Canoe River map areas adjacent to the boundary of the terranes display the characteristics of the faults as mapped by Struik in the Barkerville Terrane. Recent work by J. Kaplan (M.Sc. U.B.C., 1983 mapping) also suggests this to be the case. The on-going regional mapping project of Struik will concentrate on the tracing of the boundary fault zone to the southeast and east mainly to test the hypothesis that the Snowshoe Group is in part equivalent to the Horsethief Creek Group and that they are separated from the Cariboo Terrane by a thrust fault. This thesis project will test the hypothesis that there is a fault system within the Cariboo Terrane that is directly related to thrusting of the Cariboo Terrane onto the Barkerville Terrane characterize and date the faults that exist, and document whether the thrust system is cut by later steeper faults with possible right-lateral transcurrent movement.

1140. JOURNEAY, J.M., DIXON, J.M., CARMICHAEL, D.M., Queen's Univ. (Geological Sciences):
Crustal shearing the thermal evolution of the Shuswap-Monashee Complex, southeastern British Columbia, 1979-84; Ph.D. thesis (Journeay).

Early to mid-Jurassic impingement and accretion of composite terranes along the paleocratonic margin of southern British Columbia initiated thin-skinned detachment and eastward displacement of Alpine-style thrust nappes and tectonic slivers known collectively as the Selkirk Allochthon. The piggy-back emplacement and imbricate stacking of these allochthonous fragments resulted in signifiant crustal thickening and the development of a regional metamorphic and plutonic infrastructure (Shuswap Complex).

Mid-Jurassic imbrication and eastward over-thrusting of this evolving infrastructure onto relatively cooler and tectonically shallower levels of Aphebian basement gneiss and mantling metasedimentary rocks of the Monashee Complex resulted in thermal relaxation of the overriding thrust sheet, and the development of regional inverted metamorphism in the footwall of the Monashee Decollement. As active zones of decollement were transferred to progressively deeper levels of the crust, both the Monashee and overriding Shuswap Complexes were internally deformed and thrust toward the craton within a basement-cored duplex system.

Specific objectives for future research are: to investigate the distribution of major detachment faults within the southern Omineca Crystalline Belt, to document the displacment and internal deformation histories of the Monashee and Valhalla complexes, and to investigate the comparative thermal histories of these metamorphic complexes throughout Mesozoic and Cenozoic time.

1141. LEECH, G.B., Geol. Surv. Can.:
Geological survey of NTS 82 J W½ (Kananaskis Lakes, W½), British Columbia, 1962-.

1142. McDONOUGH, M.R., SIMONY, P.S., Univ. Calgary (Geology and Geophysics):
Baement gneisses and Hadrynian metasediments near Bulldog Creek British Columbia, 1982-84; M.Sc. thesis (McDonough).

See:

Basement gneisses and Hadrynian metasediments near Bulldog Creek, Selwyn Range, British Columbia; Geol. Surv. Can., Paper 84-1A, p. 99-102, 1984.

Detailed look at Bulldog and Yellowjacket gneisses, and to map northern and northeastern extent of Yellowjacket Gneiss.

1143. OLLERENSHAW, N.C., Geol. Surv. Can.:
Structural analysis of the Fernie Basin, British Columbia, 1975-.

1144. TAYLOR, G.C., Geol. Surv. Can.:
Structural and stratigraphic studies of northeast British Columbia, 1981-.

1145. THOMPSON, R.I., Geol. Surv. Can.:
Detailed geological study of selected areas within the Foothills Rocky Mountain belts of the Monkman Pass map area – with emphasis on the structure, 1978-.

1146. YOLE, R.W., IRVING, E., Carleton Univ. (Geology):
Stratigraphy, structure and displacement history (Paleozoic-Mesozoic) of Vancouver Island, British Columbia, 1969-85.

See:

Paleolatitudes, apparent displacements and internal rotations of the Bonanza Volcanics (Early Jurassic) of Vancouver Island, B.C.; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 8, p. A35, 1983.

Preliminary results from Jurassic rocks of Vancouver Island have yielded a paleolatitude of 21, not significantly different from that for the late Triassic obtained earlier. Preliminary structural and stratigraphic data indicate polyphase deformation for the lower part of the Sicker Group in the Saltspring – Maple Bay area. Those studies are to be extended and amplified to determine whether any major break in the Paleozoic succession can be documented. Further geological and paleomagnetic studies are to be carried out to complete the analysis of Paleozoic-Mesozoic sequences and displacement history of Vancouver Island in relation to other parts of the Insular Belt.

**NEW BRUNSWICK/
NOUVEAU-BRUNSWICK**

1147. STRINGER, P., BURKE, K.B.S., Univ. New Brunswick (Geology):
Age of the Minister Island dyke in the St. Andrews area, Newfoundland, and its relation to structure, 1983-85.

The Minister Island diabase dyke sampled on the mainland near St. Andrews, New Brunswick, has yielded a K-Ar date of 189 ± 8 Ma. Apparent continuity of the dyke westward into Maine across the major Oak Bay strike-slip fault indicates that signficant displacement on the fault predates the Lower Jurassic, although historical earthquakes are concentrated along the Oak Bay fault zone.

1148. van STAAL, C.R., WILLIAMS, P.F., Univ. New Brunswick (Geology):
Deformation and metamorphism of the region around Brunswick No. 6 and Brunswick No. 12, Bathurst area, New Brunswick, 1980-84; Ph.D. thesis (van Staal).

See:

Geology of Brunswick No. 6 and No. 12 mines; Geol. Surv. Can., Misc. Report 36, p. 7-15, 1983.

The deformation and metamorphic history of the ore bodies and surrounding rocks are being studied with a view to: 1) looking for possible localization of the ore bodies by rock deformation and/or metamorphism; and 2) understanding the behaviour of sulphides during deformation. A structural history has been determined. Work so far suggests that economic limits are related to fold interference patterns or large sheath folds.

NEWFOUNDLAND/LABRADOR/ TERRE-NEUVE/LABRADOR

1149. ELLIOTT, C., WILLIAMS, P.F., Univ. New Brunswick (Geology):
Geology of southwestern New World Island, Newfoundland, 1982-86; Ph.D. thesis (Elliott).

To study the depositional and deformational history of southwestern New World Island. It is now apparent that early thrust faulting followed by four generations of folding and an unknown number of stages of high-angle faulting are responsible for the present complex distribution of lithologies. Thrusting and the earliest phase of folding may have taken place in semi- or unlithified sediments, but could not have been initiated before late medial Ordovician times.

Further research aims include: 1) placing firmer constraints on the ages of deposition and deformation through new fossil evidence and the comparison of the geochemistry of dated and undated local intrusions; and 2) defining the tectonic setting of the area and determining its role in the Appalachians orogen.

1150. van der PLUIJM, B.A., WILLIAMS, P.F., Univ. New Brunswick (Geology):
Geology of eastern New World Island, Newfoundland 1981-84; Ph.D. thesis (van der Pluijm).

See:

Chlorite-mica aggregates in very low grade rocks (abstract); J. Structural Geol., vol. 5, p. 551, 1983.

Detailed structural mapping to understand the Lower and Middle Paleozoic history of the Newfoundland Appalachians. Furthermore, the development of foliations is being studied and their related microstructures.

NORTHWEST TERRITORIES/ TERRITOIRES DU NORD-OUEST

1151. FISCHER, B.F.G., SIMONY, P.S., SPRATT, D.A., EMBRY, A.F., OSADETZ, K.G., Univ. Calgary (Geology and Geophysics):
Structural and stratigraphic geology of the region surrounding Bunde and Bukken Fiords, Axel Heiberg Island, Canadian Arctic Archipelago, 1983-84; M.Sc. thesis (Fischer).

The region surrounding Bunde and Bukken Fiords was mapped at a scale of 1:50 000. The area is underlain by a thick succession of rocks consisting primarily of sedimentary strata similar to those which exist towards the northwestern margin of the Sverdrup Basin. Included in this package are Cretaceous mafic volcanic flows, pyroclastic units, and lithic clastic strata. Numerous sills and dikes, presumably related to the volanic activity, cut and thicken the sedimentary package.

Deformation during the Early Tertiary Eurekan Orogeny, gently deformed the strata. At least two deformational pulses can be defined within the area, an early extentional phase and a later compressional phase. A later extensional period may exist. The dominant structural elements within the area are three large steeply dipping, reverse faults, which display opposing directions of vergence. The main purpose of this study is to derive the mechanics behind the formation of these reverse faults, and to relate the extensional phases of deformation to this compressional phase. A minor component of the study will relate to the signifiance of the sills and dikes.

1152. HANMER, S., Geol. Surv. Can.:
Displacement history of major shear zones in western Churchill Province, 1983-.

1153. HENDERSON, J.R., Geol. Surv. Can.:
Geology of the Penrhyn Fold Belt, Melville Peninsula, District of Franklin, 1976-.

1154. HILDEBRAND, R.S., Geol. Surv. Can.:
Hottah Terrane, District of Mackenzie, 1982-.

See:

Geology of the early Proterozoic rocks in parts of the Leith Peninsula map area, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 217-221, 1984.

An estimate, based on magnetic interpretation, of the minimum thickness of the Hornby Bay Group, Leith Peninsula, District of Mackenzie; ibid., p. 223-228, 1984.

Continental intra-arc depressions: a nonextensional model for their origin, with a Proterozoic example from Wopmay orogen; Geology, vol. 12, no. 2, p. 73-77, 1984.

1155. HOFFMAN, P.F., Geol. Surv. Can.:
Externides of Wopmay Orogen, District of Mackenzie, 1981-.

See:

Aspects of the Rocknest Formation,Asiak thrust-fold belt, Wopmay Orogen, District of Mackenzie; Geol. Surv. Can., Paper 83-1B, p. 83-92, 1983.

The externides of Wopmay Orogen, Takijuq Lake and Kirkerk Lake map areas, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 383-395, 1984.

Short-lived 1.9 Ga continental margin and its destruction, Wopmay orogen, northwest Canada; Geology, vol. 12, no. 2, p. 68-72, 1984.

1156. OKULITCH, A.V., Geol. Surv. Can.:
Stratigraphy, structure and tectonics, Innuition Fold Belt, Ellesmere Island, District of Franklin, 1979-.

1157. PADGHAM, W.A., BOWRING, S.A., Indian and Northern Affairs Canada (Geol. Div.), Washington Univ.:
Evolution of the Anialik River granite-gneiss-implications for evolution of contained auriferous quartz veins, 1982-86.

U-Pb zircon ages of old phases of granite-gneiss (migmatite paleosome) expected shortly. Dating of surrounding volcanics and younger granite underway.

1158. ST-ONGE, M.R., Geol. Surv. Can.:
Thrust-fold belt of Wopmay Orogen – internal zone, District of Mackenzie, 1981-.

See:

Deformation and metamorphism of the Coronation Supergroup and its basement in the Hepburn metamorphic-plutonic zone of Wopmay Orogen: Redrock Lake and the eastern portion of Calder River map areas, District of Mackenzie; Geol. Surv. Can., Paper 84-1A, p. 171-180, 1984.

Geothermometry and geobarometry in pelitic rocks of north-central Wopmay Orogen (early Proterozoic), Northwest Territories, Canada; Geol. Soc. Amer., Bull., vol. 95, no. 2, p. 246-253, 1984.

1159. VAN BERKEL, J.T., SCHWERDTNER, W.M., TORRANCE, J.G., FOLEY, S., HUGON, H., VAN KRANENDONK, M., Univ. Toronto (Geology):
Mechanical role of evaporites in the natural deformation of sedimentary piles, 1982-85; M.Sc. thesis (Torrance).

See:

Study of anticlines, faults and diapirs in the central Eureka Sound fold belt: preliminary results; Bull. Can. Petrol. Geol., vol. 32, p. 109-116, 1983.

Report on the Second Workshop of the Canadian Tectonics Group, Abstracts; Structural Geol., vol. 5, p. 549-554, 1983.

In the 1984 field season we will complete our field studies in the Strand Fiord area (west-central Axel Heiberg Island), and of the Stolz Thrust Zone and the Gibs diapir (eastern Axel Heiberg Island).

1160. WILLIAMS, G.K., Geol. Surv. Can.:
Northern basin analysis program: Redstone and Great Slave Lake map-areas, District of Mackenzie, 1971-.

NOVA SCOTIA/NOUVELLE-ÉCOSSE

1161. CLIFFORD, P.M., PRYER, L.L., THOMSON, J., McMaster Univ. (Geology):
Cleavage morphology and strain, Goldenville Formation, Nova Scotia, 1983-84.

Spaced cleavage is well developed in cored samples of greywacke from the Goldenville anticline, Nova Scotia. Cleavage zones, about 1-2 mm wide and spaced at 10-15 mm in intervals, are composed mainly of preferentially aligned micas. Intervening lithons are overwhelmingly quartzose. Quartz grains in cleavage zones are markedly inequant due to pressure solution trimming. Grains are strongly aligned parallel to cleavage zone orientation, but they lack quartz pressure shadows. From cleavage zone margin to mid-lithon, quartz grains show progressively less inequancy, and increased fluctuation in the orientation of long axes. Pressure shadows occur on some grains. This is interpreted as heterogeneity in shortening normal to cleavage, and in growth parallel to cleavage. Bulk shortening is estimated at between 40% and 60%, in accord with calculations elsewhere based on chemistry. This bulk shortening is made up of very high shortening in cleavage zones – more than 80% is quite likely – and very much lower, laterally variable, shortening within lithons.

1162. HWANG, S.G., STEVENS, G.R., Acadia Univ. (Geology):
Structure analysis of late Paleozoic rocks in southwestern Nova Scotia, 1984-85; M.Sc. thesis (Hwang).

1163. KEPPIE, J.D., O'BRIEN, B.H., SMITH, P.K., HAYNES, S.J., DALLMEYER, D.A., KROGH, T.E., WALDRON, J.W.F., MUECKE, G.K., Nova Scotia Dept. Mines and Energy:
Meguma gold project, Nova Scotia, 1982-84.

See:

Meguma gold project, The Country Harbour area, Guysborough County, Nova Scotia; Geological history of the Isaacs Harbour area, Parts of 11/F and 11/F4, Guysborough County, Nova Scotia; The structure of the Meguma Group between Gegogan Harbour and Country Harbour, Guysborough County; Typomorphism of turbidite-hosted auriferous quartz veins, southern Guysborough County; Geology of the Cochrane Hill gold deposit, Guysborough County, Nova Scotia; Sedimentary features of some Goldenville Formation sandstones, Sherbrooke area, eastern Nova Scotia; Nova Scotia Dept. Mines and Energy, Report 83-1, 1983.

1164. SMITH, P.K., KEPPIE, J.D., HAYNES, S.J., O'BRIEN, B.H., Nova Scotia Dept. Mines and Energy:
Meguma gold project, Nova Scotia, 1982-84.

See:

The structure of the Meguma Group between Gegogan Harbour and Country Harbour, Guysborough County; Nova Scotia Dept. Mines and Energy, Report 83-1, p. 145-181, 1983.

Final report dealing with auriferous vein arrays and their relation to regional deformation due in 1984.

1165. STEVENS, G.R., QUARCH, H., Acadia Univ. (Geology):
Correlation of geologic, geophysical and geochemical field data with structures derived from computer processed landsat imagery, 1981-84.

ONTARIO/ONTARIO

1166. CLIFFORD, P.M., RICE, M.C., McMaster Univ. (Geology):
Solution seams and material loss in Silurian carbonate, Dundas, Ontario.

Silurian carbonate rocks in the Niagara Escarpment at Dundas, Ontario contain abundant stylolitic and smooth solution seams. These structures are relatively sparse in "clean" rocks; but "dirty" and markedly inhomogeneous rocks are replete with such structures, which may account for as much as ten percent of some samples. Stylolitic geometries occur in at least two specific patterns, mutually exclusive. For both geometries, microhardness is consistently highest in the concave stylolite column tip, compared to microhardness elsewhere in the rock. Stylolites occur at intervals of about 5 cm. By contrast, curviplanar seams are commonly in dense clusters, each seam thin and wispy; but a few are thick and very sharply differentiated from enclosing rock. Small pryite grains are about ten times as abundant in such seams as in adjacent rock, implying a local loss of material equivalent to nine times the present seam thickness. Such seams appear to be the result of amalgamation of other stylolites or seams. All are parallel to regional layering. Loss of 1-2% of portions of the rock column, homogeneously distributed laterally, and a greatly increased anisotropy of permeability, are implied.

1167. CONNELLY, J.N., DIXON, J.M., CARMICHAEL, D.M., HANMER, S., Queen's Univ. (Geological Sciences):
Natural strain variation patterns: Investigation of potential mechanical interaction between a batholith and its host rocks, 1983-85; M.Sc. thesis (Connelly).

A suite of sodic granitoid batholiths were emplaced into the Central Metasedimentary Belt north of Madoc, Ontario at about 1226 Ma and are now unconformably overlain by metasediments of the Flinton Group. Lithologic and stratigraphic studies have been done but structural work is lacking. To: 1) document strain variation patterns around one of the batholiths (Elzevir) and compare these patterns to experimental models produced in a centrifuge; 2) investigate the effects of the regional deformation on the batholith and host rock; and 3) identify materials for more refined dating of regional deformation in the batholith terrain in order to relate it to the regionally dominant overthrust tectonics in adjacent areas.

1168. DILLON, E.P., SPRINGER, J.S., COLVINE, A.C., BARRON, P.S., Ontario Geol. Surv.:
Talc and the Tudor metavolcanics, Grenville Province, southeastern Ontario – geology, alteration, applications and marketability, 1982-84.

See:

Talc and the Tudor mafic metavolcanics, Tudor, Madoc and Elzevir townships; Ontario Geol. Surv., Misc. Paper 116, 1984.

Potentially economic occurrences of talc-chlorite-dolomite schist are hosted in altered metavolcanics of the Tudor Formation in the contact metamorphic aureole of the Elzevir batholith. Detailed geological mapping and subsequent petrographic studies of thin secitons of mineralized samples have indicated substantial zones of talcose material up to 50 m wide and 300 m in strike length which average 40 to 60% talc.

Mineralogical studies indicate that much of the talcose material could be beneficiated to A 90+% talc product suitable for a variety of filler and ceramics applications.

Further detailed exploration, mineralogical studies and bulk testing of this material are required to fully appreciate the significance of this new talc resource.

1169. HANMER, S., Geol. Surv. Can.:
Structural studies in the Grenville Province of Ontario and western Quebec, 1983-.

1170. ROBIN, P.Y.-F., SAWYER, E.W., Univ. Toronto (Geology):
Rock deformation: mechanisms, and effects on fluid flow, metamorphic reactions and melting, 1982-85; Ph.D. thesis (Sawyer).

1171. TREMBLAY, L., WHITE, J.C., Univ. New Brunswick (Geology):
Deformation of feldspars in anorthositic rocks from Parry Sound, Ontario, 1984-85; M.Sc. thesis (Tremblay).

1172. WILLIAMS, H.R., BUCK, S. Brock Univ. (Geological Sciences):
Structure of Longlac and Geraldton areas, Ontario, 1984-; M.Sc. thesis (Buck).

Carrying out detailed structural mapping of region of Geraldton and Longlac. Relating gold occurrences to the structure of the region.

1173. WILSON, B.C., DIXON, J.M., HELMSTAEDT, H., Queen's Univ. (Geological Sciences):
Shear fracturing and intrusion in the Red Lake volcanic belt, 1982-86; Ph.D. thesis (Wilson).

See:

Shear fracturing and gold localization in the Red Lake volcanic belt; Geol. Assoc. Can. – Mineral. Assoc. Can., Program with Abstracts, vol. 9, p. 116, 1984.

Involves an examination, evaluation and synthesis of late fracturing and fracture – controlled intrusion in the Red Lake volcanic belt. Preliminary data, based on one season of field work, indicate that styles and orientations of fractures are coherent across much of the belt in both supracrustal and intrusive rocks and that magmatic and hydrothermal fluids have been intruded predominantly into shear fractures. Patterns of fracturing and intrusion suggest significant new criteria for rock deformation and gold exploration.

QUÉBEC

1174. DAIGNEAULT, R., ALLARD, G.O., Québec Ministère Énergie et Ressources:
Structure et stratigraphie de la région de Chibougamau, Québec, 1982-85.

Les travaux effectués et ceux à venir permettront l'élaboration d'un modèle structural pour la région de Chibougamau. Ce modèle permettra de dégager plusieurs implications d'ordre stratigraphiques et économiques.

1175. PROCYSHYN, E., Québec Ministère Énergie et Ressources:
Mines Madeleine et Murdochville, Québec, 1982-85.

Établir un modèle tectonique détaillé des régions adjacentes aux Mines Madeleine et à Mines Gaspé. Relations entre structure et minéralisation.

1176. ROY, D.W., DAIGNEAULT, R., MARCHAND, K., Univ. Québec à Chicoutimi (Sciences de la Terre), Québec Ministère Énergie et Ressources:
Elements structuraux dans la Formation Waconichi, canton McKenzie, Chibougamau, Québec; thèse de maîtrise (Marchand).

1177. ROY, D.W., JOURDAIN, V., Univ. Québec à Chicoutimi (Sciences de la Terre):
Analyse structurale du gisement d'or de Montauban, Québec; thèse de maîtrise (Jourdain).

1178. STEVENS, K., WILLIAM-JONES, A., McGill Univ. (Geological Sciences), Québec Ministère Énergie et Ressources:
Métallogénie du Dôme de Lemieux, Québec, 1982-85; thèse de doctorat (Stevens).

Évaluation du potentiel minier de la région du Dôme de Lemieux et mise au point de guides dans l'évaluation des gisements hydrothermaux de la Gaspésie.

YUKON TERRITORY/TERRITOIRE DU YUKON

1179. COOK, D.G., Geol. Surv. Can.:
Structural studies in the Mackenzie Arc, Franklin Mountains and Colville Hills, Yukon and District of Mackenzie, 1975-.

1180. NORRIS, D.K., Geol. Surv. Can.:
Structural geology of northern Yukon Territory and northwestern District of Mackenzie, 1969-.

1181. TEMPELMAN-KLUIT, D.J., Geol. Surv. Can.:
Stratigraphy, structure and metallogeny of Pelly Mountains and Yukon Plateau, Yukon Territory, 1973-.

GENERAL/GÉNÉRALITÉS

1182. CHAMBERLAIN, V.E., LAMBERT, R.St.J., Univ. Alberta (Geology):
Tectonics of the Rocky Mountain Trench, 1982-85.

Studies of the Malton Gneiss Complex and of the adjacent metasediments show that rocks East and West of the Trench differ in age and history. Geophysical evidence indicates that the Trench is a major crustal boundary. Models for Cordilleran tectonics have been constructed invoking major transform movement (dextral transcurrent) on the RMT in the Cretaceous, continental collision in the Yukon at 100 Ma and thrusting of the Mackenzies before the Rockies. The latter were formed as a mini-ocean or back-arc basin closed in the second half of the Cretaceous.

1183. DIXON, J.M., Queen's Univ. (Geological Sciences):
Experimental centrifuge-model study of the evolution of foreland fold and thrust belts, 1982-85.

The experimental method of centrifuge-modelling is applied to study of the evolution of foreland fold and thrust belts. The foci of the study are the relationships between ductile folding and brittle faulting and jointing, the overprinting relationships produced in a thrust sheet as it migrates up ramps and along bedding glide zones during motion on a stepped thrust fault, and the influence of transerve ramps on the structures produced in the thrust sheet.

Recent advances in techniques of model construction permit the use of microlaminated, anisotropic mutilayers that accurately simulate both the geometric (e.g. bed thickness) and rheologic (e.g. ductility contrast, flow properties) of sedimentary sequences such as interbedded limestone and shale.

The experimental modelling is carried out using the 20 000 g centrifuge in the Experimental Tectonics Laboratory at Queen's University.

1184. KING, L.H., Geol. Surv. Can.:
Bedrock and surficial geology, Grand Banks, 1973-80.

1185. MAILATH, S., LAMBERT, R.St.J., Univ. Alberta (Geology):
Tectonic history of the Rockies and adjacent prairies, 55-60°N, 1983-85; M.Sc. thesis (Mailath).

To study the paleothermal history of the Cretaceous and to relate it to tectonic causes. In particular, to examine the tectonic setting of the oil sands.

1186. MASE, C.W., SMITH, J.L., Univ. British Columbia (Geological Sciences):
Pore-fluid pressures and frictional heating on a fault surface, 1983-85; Ph.D. thesis (Mase).

Analytical and numerical solutions of the coupled equations of heat transfer, fluid flow, and stress equilibra are used to simulate the thermal expansion, pressurization, and flow of pore fluids subject to frictional heating on a fault surface. Emphasis is placed on developing a basic understanding of the role of thermal expansion and pressurization of pore fluids in the physics of earthquake processes. Results indicate that during an earthquake event, the failure surface is heated to a temperature required for the rate of fluid production due to thermal expansion to equal the rate of fluid loss due to fluid flow and pore dilatation. Once this condition is established, the pore fluids pressurize and the shear strength decreases to a value sufficient to maintain the thermal pressurization of pore fluids at near-lithostatic values. The rate at which thermal pressurization proceeds depends primarily on the hydraulic characteristics of the surrounding porous medium. If either the permeability exceeds $10^{-19}m^2$ or the porous medium compressibility exceeds $10^{-8}Pa^{-1}$, then frictional melting may occur on the failure surface before thermal pressurization becomes significant. For future work we intend to incorporate a constitutive relationship for the shear strength of surrounding material. This will allow us to remove the constraint of failure along a plane, and allow the fault zone to broaden or contract with deformation.

1187. PATE, C., LAMBERT, R.St.J., Univ. Alberta (Geology):
Tectonic history of the Rockies and adjacent prairies, western Canada, 1983-85; M.Sc. thesis (Pate).

To study the theory of loading of the North American plate by Rocky Mountain thrusting and to relate it to the subsidence history of the Cretaceous.

1188. SCHWERDTNER, W.M., Univ. Toronto (Geology):
Strain analysis in the Canadian Shield, 1979-85.

See:

Strain patterns of crescentic granitoid plutons in the Archean greenstone terrain of Ontario; J. Structural Geol., vol. 5, no. 3/4, p. 419-430, 1983.

Calculation of finite experimental deformations in ductile geological materials and structural models; Tectonophysics, vol. 93, p. T1-T7, 1983.

Report on the second meeting of the Canadian Tectonics group; held on 23-24 October 1982 at Gravenhurst, near Toronto; J. Structural Geol., vol. 5, no. 3, p. 349-354, 1983.

1189. SOUTHER, J.G., Geol. Surv. Can.:
Study of the Cenozoic evolution of the western Cordillera, 1977-.

See:

Chronology of the peralkaline late Cenozoic Mount Edziza Volcanic Complex, northern British Columbia, Canada; Geol. Soc. Amer. Bull, vol. 95, no. 3, p. 337-349, 1984.

1190. SRIVASTAVA, S.P., Geol. Surv. Can.:
Comparative studies of the continental margins of the Labrador Sea and of the North Atlantic, 1978-.

1191. STEVENS, G.R., BONYON, D.A., Acadia Univ. (Geology):
Enhanced computer program for display and analysis of structural geologic data, 1981-84.

1192. STRINGER, P., TREAGUS, J.E., Univ. New Brunswick (Geology), Univ. Manchester (Geology):
Relation of cleavage to folding in the Appalachian-Caledonian orogenic belt, 1975-85.

See:

Asymmetrical folding in the Hawick Rocks of the Galloway area, Southern Uplands: reply; Scott J. Geol., vol. 19, p. 107-112, p. 118-122, 1983.

Further evidence is provided for southeastward vergence of first order F_1 folds in the Silurian strata of southwest Scotland (in contrast to previous interpretations of northwestward vergence), and for distribution of intermediate scale F_1 folds consistent with development of the first order F_1 folds at a subduction zone.

1193. TSIKOS, G., DIXON, J.M., Queen's Univ. (Geological Sciences):
Centrifuge scale modelling of diapir/cover sequence interaction (and fracture analysis in resulting 3-D strain field), 1982-84; M.Sc. thesis (Tsikos).

To test the theory of faulting in a 3-d strain field (Reches, 1978). This related the orientation of sets of contemporaneous fractures to the orientation of the principal strain axes in the rock. Using materials such as wax, plasticine and silicone putty, models are constructed and spun in a centrifuge in such a way as to induce the diapiric rise of a buoyant material through an anisotropic multilayer or relatively greater density.

Following serial-sectioning, the strain field is defined at the crestal region of the diapir using simple strain markers. The fault sets are mapped on serial sections, digitized and their spatial orientation determined. On plotting on equal-area stereographic projections, their orientations are compared to those of the principal strain axes. Further analyses will compare the configuration of the faults with published data in the form of seismic sections from different parts of the world.

1194. WILLIAMS, P.F., Univ. New Brunswick (Geology):
Deformation mechanisms and tectonic processes, 1980-.

See:

Deformation and metamorphism in the Bard area of the Seisia Lanzo Zone, Western Alps, during subduction and uplift; J. Metamorphic Geol., vol. 1, p. 117-140, 1983.

Deformed rocks are being studied with a view to better understanding the processes involved in their deformation. The ultimate goal is a better understanding of the processes involved in large scale tectonics.

VOLCANOLOGY/VOLCANOLOGIE

1195. BOSTOCK, H.H., Geol. Surv. Can.:
Volcanic rocks of the Appalachian region, 1973-.

1196. CARTER, M.W., THURSTON, P.C., Ontario Geol. Surv:
McComber and Vincent Townships, Ontario, 1983-84.

The map-area is underlain by Precambrian Archean and Proterozoic rocks mantled by a narrow linear belt of Pleistocene glaciofluvial and Recent deposits located across the northern part of the map-area.

The Archean rocks comprise metavolcanic and metasedimentary rocks, metagabbroic sills, granitic rocks and quartz and feldspar porphyries. Database dikes which cut the metavolcanic and metasedimentary rocks may be Archean or Proterozoic in age.

The supracrustal rocks occur as linear northeasterly-trending belts comprising alternating metavolcanic and metasedimentary belts. The volcanic rocks are subaqueous tholeiitic mafic rocks, the sediments comprise wackes and iron formation units, both groups metamorphosed to the greenschist facies. In the northern half of the area the supracrustal rocks form an inverted anticlinal sequence, whereas in the south the metasediments are a right-way-up north facing homoclinal sequence.

Proterozoic rocks comprise a diabase sill occurring in three discrete outcrop areas, dipping to the west.

Mineral deposits consits of gold occurring in quartz veins, shear zones, and quartz veins emplaced in iron formation units.

1197. CHURCH, B.N., EWING, T.E., HORA, Z.D., British Columbia Ministry Energy, Mines, Petrol. Res. (Geol. Br.):
Geology of Tertiary basins and related coal and mineral deposits, south-central British Columbia.

See:

Volcanology, structure, coal and mineral resources of Early Tertiary outliers in south-central British Columbia; Geol. Assoc. Can., Field Trip Guidebook No. 1, 1983.

The Farleigh Lake radioactive occurrence; British Columbia Ministry Energy, Mines, Petrol. Res., Paper 1984-1, p. 15-18, 1984.

Tertiary volcanism in the Okanagan Valley has resulted in an accumulation of more than 2800 metres of volcanic breccia, lava, and interbedded volcano-derived sedimentary rocks. Most of this activity occurred in a brief span of 4.7 Ma during the lower Eocene.

Rifting, graben, and caldera development was accompanied by the eruption of andesites, trachytes, and mafic phonolite lavas and pyroclastic rocks. Renewed volcanism of a more quiescent nature began in lower Miocene with the eruption of olivine basalt and a minor amount of rhyolite. Episodic eruption of basalt continued into the Pliocene and Pleistocene on a much reduced scale.

The structural control of the Eocene rocks relates to east-west trending synclines and a pattern of north-south tension faults, conjugate shears, and thrusts. These folds and fractures are viewed as essential elments in a north-south directed stress scheme thought to be responsible for the many graben-like structures and overall basin and range fabric of the region.

The eruption of large volumes of basalt beginning in the Miocene appears to have a different significance – perhaps consequent of the westerly drift of the continent and overriding of the oceanic plate.

1198. CLIFFORD, P.M., McMaster Univ. (Geology):
Rotoiti Breccia New Zealand, sedimentologic study of an ignimbrite, 1979-84.

The Rotoiti Breccia (Bay of Plenty area, New Zealand) is a rhyolitic ignimbrite, emplaced roughtly 45 000 years ago. No vent area has been recognized with certainty but a source in the Okataina Volcanic Centre seems most likely. Near this presumed source, some 30 kms inland from the Pacific coast, the breccia has a thickness of about 100 m locally; but thickness descreases to less than 10 m in places along its ocean-eroded margin. Presumably the original terminus was seaward of the current coast-line. Entry of the ignimbrite into the ocean has been held responsible for secondary phreatic explosions which generates Rotoehu Ash. Proximally, the flow is simple, with insignificant vertical variation in grain size distribution. Proceeding oceanward multiple flow units are recognized by grain size variations, local airfall lenses, and pisolite accumulations. Also proceeding distally, there is a decrease in the maximum size of pumice clasts and of accidental (lithic) clasts. The multiplicity of flow units is probably due to splitting of the main flow to pass around "islands" of Mesozoic rocks. Emplacement temperature and thickness jointly were insufficient to induce welding. Emplacement was due to gravitational collapse of a Plinian eruption column.

1199. CLIFFORD, P.M., McMaster Univ. (Geology):
Lava tube morphology and cooling history, Muriwai, New Zealand, 1980-84.

Lava tubes at Muriwai, New Zealand, are well developed, with circumferential corrugations, longitudinal extrusion striations, spaced cracks with local "budding", and bread-crust type exterior. Skin is very consistent in thickness for all sizes; large-diameter tubes do not have circular sections though skin is consistent; skin is glassy with feldspar euredra. Interiors are unlayered. Vesicles incres in diameter slightly towards tube top.

For small equivalent diameters (<40 cm) skin was sufficiently rigid to maintain a circular section. For larger tubes, lava loading of the tube led to elliptical sections.

Undistorted vesicles, and unaligned, randomly distributed crystals suggest that these tubes had lava at rest as gas exhaled and moved. They are probably distal portions of flows.

1200. HAMILTON, T.S., Geol. Surv. Can.:
Volcanic rocks of the Insular Belt and adjacent deep ocean, British Columbia, 1982-.

1201. HICKSON, I., MATHEWS, W.H., BARNES, W.C., SOUTHER, J.G., ARMSTRONG, R.L., Univ. British Columbia (Geological Sciences), Geol. Surv. Can.:
Late Cenozoic geologic history of the Clearwater-Wells Gray area, British Columbia, 1981-86; Ph.D. thesis (Hickson).

See:

Late Cenozoic volcanic rocks of the Clearwater-Wells Gray area, British Columbia; Can. J. Earth Sci., vol. 21, no. 3, p. 267-277, 1984.

Volcanological and environmental reconstruction of the area for the last 1/2 million years; geochemical analysis and interpretation of the basalts and associated parental magmas in a local and regional context.

1202. IMREH, L., DIMROTH, E., BEULLAC, R., LACOSTE, P., Québec Ministère Énergie et Ressources:
Gîtologie prévisionnelle, Abitibi méridional, Québec, 1972-86.

See:

Evolution of the south-central segment of the Abitibi Belt, Québec. Part II: Tectonic evolution and geomechanical model; Can. J. Earth Sci., vol. 20, no. 9., p. 1355-1373, 1983.

Evolution of the south-central segment of the Abitibi Belt, Québec. Part III: Plutonic and metamorphic evolution and geotectonic model; ibid., p. 1374-1388, 1983.

La phase de terrain du projet est achevée. La synthèse volcanologique, lithostratigraphique et gîtologique est sous presse (M.E.R. Mémoire 82-04). La préparation pour édition des cartes au 1/20 000 et 1/50 000 est commencée. L'interprétation des données lithochimiques dans leur cadre volcanique et stratigraphique sera amorcée au cours de l'année budgétaire 84/85.

1203. VAN WAGONER, N.A., Acadia Univ. (Geology):
Pre-Carboniferous physical volcanology and metallogenesis of the Avalon Zone of Cape Breton Island and New Brunswick, 1984-.

To determine the volcanic stratigraphy, volcanic evolution, tectonic setting and metallogenesis of the Avalon Zone of Nova Scotia and New Brunswick, to establish and refine criteria which may be used to determine paleo-eruptive environment, and to establish volcanological criteria which may be used to search for undiscovered mineral deposits.

1204. VAN WAGONER, N.A., JOHNSON, H.P., Acadia Univ. (Geology), Univ. Washington:
Controls on the formation of segregation vesicles and their use as an orientation tool, 1978-.

See:

Magnetic properties of three segments of the Mid-Atlantic Ridge at 37°N; Famous, Narrowgate and AMAR; J. Geophysical Res., vol. 88, p. 6335-6350, 1983.

Critical evaluation of segreation vesicles in mid-ocean ridge basalts as a rock orientation tool; ibid., p. 8318-8332, 1983.

Segregation vesicles can be used to orient seafloor basalts for structural and paleomagnetic polarity studies. They were used to orient dredge and submersible samples from the FAMOUS area and helped reveal the occurrence of reversely magnetized but probably Brinhes age crust. Application of the technique to DSDP drill cores from the North Atlantic revealed that the crust is structurally and magnetically heterogeneous and in places, rocks are steeply dipping and overturned. The goal of future studies is to determine compositional and depth controls on the formation of these vesicles.

1205. VAN WAGONER, N.A., ROBINSON, H.P., LeCHIMINANT, G., Acadia Univ. (Geology), Univ. Washington:
Volcanic setting of the Alpha ridge, 1984-.

To determine the tectonic setting of the Alpha Ridge by an examination of the volcanic rocks recovered during the CESAR project and a study of volcanic clasts in sedimentary rocks.

1206. VAN WAGONER, N.A., VAN WAGONER, S.L., Acadia Univ. (Geology), Univ. Manitoba:
Volcanic evolution and tectonic setting of the Proterozoic Flin Flon-Snow Lake greenstone belt, Saskatchewan-Manitoba, 1981-.

The volcanic stratigraphy of the Amisk Lake portion of the Flin Flon-Snow Lake greenstone belt indicates that the area evolved as a volcanic island which was subjected to alternating periods of transgression and regression due to the effects of loading and subsidence. Above-wave-base deposits are clearly recognized by their distinctive characteristics and used to indicate the paleo-positions of sea level. Parts of the area are highly mineralized and future studies include 1) a comparison of the physical volcanology of mineralized and unmineralized zones, and 2) continued detailed studies of flow and sedimentary structures as indicators of mode of deposition and paleovolcanology.

1207. ZAVNSCHERB, E., CLIFFORD, P.M., McMaster Univ. (Geology):
Bubble distribution and form, and flow in Hawaiian basalts, 1983-86.

Vesicle morphology distributions in Hawaiian lavas are directly related to viscosity variations in the flow prior to solidification. Vesiculation is greatest near flow boundaries. Shapes range from circular section to highly elliptical section, seen in slabs cut parallel to flow directions. Inclination of vesicles long axes is least at margins, increasing inward.

The morphology variation can be explained by bubble motions across a flow direction, where the bubble behaves as a high reynolds number fluid in a low reynolds number fluid undergoing inhomogeneous shear.

Acadia University,
Department of Geology,
Wolfville, Nova Scotia
B0P 1X0

Alberta Research Council,
Geological Survey,
3rd Floor, Terrace Plaza,
4445 Calgary Trail South,
Edmonton, Alberta
T6H 5R7

Alberta University,
Department of Civil Engineering,
Edmonton, Alberta
T6G 2GL

Alberta University,
Department of Geology,
Edmonton, Alberta
T6G 2E3

Alberta University,
Department of Zoology,
Edmonton, Alberta
T6G 2E9

Bristol University,
Department of Geology,
Bristol, England
BS8 1TR

British Columbia University,
Department of Geological Sciences,
6339 Stores Road, University Campus,
Vancouver, British Columbia
V6T 2B4

British Columbia Ministry of Energy,
Mines, and Petroleum Resources,
Geological Branch,
Parliament Buildings,
Victoria, British Columbia
V8V 1X4

Brock University,
Department of Geological Sciences,
St. Catharines, Ontario
L2S 3A1

Calgary University,
Department of Geology and Geophysics,
2500 University Drive N.W.,
Calgary, Alberta
T2N 1N4

Canada Centre for Mineral and
Energy Technology (CANMET)
Department of Energy, Mines and
Resources,
555 Booth Street,
Ottawa, Ontario
K1A 0G1

Carleton University,
Department of Geology,
Ottawa, Ontario
K1S 5B6

College of Cape Breton,
Department of Geology,
P.O. Box 5300,
Sydney, Cape Breton,
Nova Scotia
B1P 6L2

Dalhousie University,
Department of Geology,
Halifax, Nova Scotia
B3H 3J5

École Polytechnique,
Département de Génie minéral,
Campus de l'Université de Montréal,
Case postale 6079, Succ. "A",
Montréal, Québec
H3C 3A7

Environment Canada,
National Hydrology Research Institute,
Ottawa, Ontario
K1A 0E7

Geological Survey of Canada,
Department of Energy, Mines
and Resources,
601 Booth Street,
Ottawa, Ontario
K1A 0E8

Indian and Northern Affairs Canada,
Geology Office,
Box 1500,
Yellowknife, N.W.T.
X1A 2R3

Laval University,
Département de géologie et
minéralogie,
Cité Universitaire,
Ste. Foy, P.Q.
G1K 7P4

Manitoba University,
Department of Earth Sciences,
Winnipeg, Manitoba
R3T 2N2

Manitoba Department of Energy
and Mines,
Mineral Resources Division,
993 Century Street,
Winnipeg, Manitoba
R3H 0W4

McGill University,
Department of Geological Sciences,
3450 University Street,
Montréal, Québec,
H3A 2A7

McGill University,
Redpath Museum,
859 Sherbrooke St. W.,
Montréal, Québec
H3A 2K6

McMaster University,
Department of Geology,
Hamilton, Ontario
L8S 4M1

Memorial University of Newfoundland,
Department of Earth Sciences,
St. John's, Newfoundland
A1B 3X5

Ministère de l'Énergie et des
Ressources du Québec,
1620, boul. de l'Entente,
Québec, Québec
G1S 4N6

Mount Allison University,
Department of Geology,
Sackville, New Brunswick
E0A 3C0

National Research Council,
Division of Building Research,
Ottawa, Ontario
K1A 0R6

New Brunswick University,
Department of Geology,
Box 4400,
Fredericton, New Brunswick
E3B 5A3

New Brunswick University,
Department of Geology,
Tucker Park,
P.O. Box 5050,
Saint John, New Brunswick
E2L 4L5

New Brunswick Department
of Natural Resources,
Mineral Resources Division,
P.O. Box 6000,
College Hill Road,
Fredericton, New Brunswick
E3B 5H1

Newfoundland Department of
Mines and Energy,
Mineral Development Division,
P.O. Box 4750,
St. John's, Newfoundland
A1C 5T7

Nova Scotia Department of
Mines and Energy,
1690 Hollis Street,
P.O. Box 1087,
Halifax, Nova Scotia
B3J 2X1

Ontario Ministry of the Environment,
Water Resources Branch,
Suite 100-135 St. Clair Avenue West,
Toronto, Ontario
M4V 1P5

Ontario Ministry of Natural Resources,
Ontario Geological Survey,
11th Floor - 77 Grenville Street,
Toronto, Ontario
M5S 1B3

Ottawa University,
Département de Géographie,
Ottawa, Ontario
K1N 6N5

Ottawa University
Department of Geology,
Ottawa, Ontario
K1N 6N5

Polar Continental Shelf Project,
Department of Energy, Mines
and Resources,
880 Wellington Street,
Ottawa, Ontario

Université du Québec à Chicoutimi
Département des Sciences de
la Terre,
930 est, rue Jacques-Cartier,
Chicoutimi, Québec
G7H 2B1

Université du Québec à Montréal,
Département des Sciences de
la Terre,
Case postale 8888,
Montréal, Québec
H3C 3P8

Université du Québec à Québec,
Institut National de la Recherche
Scientifique (INRS-Géoressources),
555, boul. Henri IV,
Case postale 7500,
Ste-Foy, Québec
G1V 4C7

Queen's University,
Department of Geography,
Kingston, Ontario
K7L 3N6

Queen's University,
Department of Geological Sciences,
Kingston, Ontario
K7L 3N6

Royal Ontario Museum,
Department of Mineralogy and Geology,
100 Queen's Park,
Toronto, Ontario
M5S 2C6

Royal Ontario Museum,
Department of Vertebrate Palaeontology,
100 Queen's Park,
Toronto, Ontario
M5S 2C6

St. Francis Xavier University,
Department of Geology,
Antigonish, Nova Scotia
B2G 1C0

Saskatchewan Museum of Natural History,
Wascana Park,
Regina, Saskatchewan
S4P 3V7

Saskatchewan University,
Department of Geological Sciences,
Saskatoon, Saskatchewan
S7N 0W0

Saskatchewan Department of
Mineral Resources,
Saskatchewan Geological Survey,
1211-1914 Hamilton Street,
Regina, Saskatchewan
S4P 4V4

Saskatchewan Research Council,
Geology Division,
30 Campus Drive,
Saskatoon Saskatchewan
S7N 0X1

Université de Sherbrooke,
Département de Géographie,
Sherbrooke, Québec
J1K 2R1

Simon Fraser University,
Department of Physics,
Burnaby, British Columbia
V5A 1S6

Sir Sandford Fleming College,
School of Natural Resources,
Frost Campus,
P.O. Box 8000,
Lindsay, Ontario
K9V 4S6

Toronto University,
Department of Geology,
Toronto, Ontario
M5S 1A1

Waterloo University,
Department of Earth Sciences,
Waterloo, Ontario
N2L 3G1

Western Ontario University,
Department of Geology,
Biological and Geological Building,
London, Ontario
N6A 5B7

York University,
Department of Geography,
4700 Keele Street,
Downsview, Ontario
M3J 2R7

Department of Energy, Mines and Resources, Research Agreements 1983-84/ Ministère de l'Énergie, des mines et des ressources, conventions de recherche 1983-84

BRITISH COLUMBIA

University of British Columbia

Bustin, R.M. (Geology)
Structure and sedimentology, Groundhog coalfield, central British Columbia, $7,700.00
Clowes, A.M. (Geophysics and Astronomy)
Crustual structure of Queen Charlotte Sound from seismic refraction studies, $6,750.00.
Ellis, R.M. (Geophysics and Astronomy)
The 1949 Queen Charlotte islands earthquake (M=8.1), $6,700.00.
Greenwood, H.J. (Geology)
Structure and metamorphism of the northern Cariboo Mountains, British Columbia, $10,300.00.
Slawson, W.F. (Geophysics and Astronomy)
Establishment and analysis of precise geodetic networks: Vancouver Island, $7,200.00.
Watanabe, T. (Geophysics and Astronomy)
Geomagnetically induced currents in power transmission systems, $4,200.00.

Simon Fraser University

Huntley, D.J. (Physics)
Dating of sediments by thermoluminescence, $7,500.00.

ALBERTA

University of Alberta

Chatterton, B.D.E. (Geology)
Silurian trilobite and conodont faunas of the Mackenzie Mountains, $4,000.00.
Hein, F.J. (Biology)
Sedimentology and geotechnical properties of surficial (upper 3 m) bottom sediment., Baffin Island fjords, $7,000.00.
Jones, F.W. (Physics)
An investigation of the relationships between geothermal and other geophysical and geological data in high temperature regions of the Western Canadian sedimentary basin, $3,750.00.
Longstaffe, F.J. (Geology)
Stable isotope geochemistry of sedimentary host rocks, Tom Pb-Zn property, MacMillan Pass, Selwyn Basin, $7,500.00.
Morton, R.D. (Geology)
Investigation of stratabound Zn-Pb-Ag deposits of the Proterozoic Horsethief Creek Group of South British Columbia, $6,000.00.
Schwartz, F.W. (Geology)
A three dimensional model for radioactive proglacial transport, $9,500.00.

University of Calgary

Simony, P.S. (Geology and Geophysics)
Stratigraphy, tectonics and metamorphism in Blue River area of Cariboo Mountains, $12,500.00.

SASKATCHEWAN

University of Regina

Binda, P.L. (Geology)
Stratiform copper occurrences of the Belt Supergroup in Canada, $6,000.00.
Vigrass, L.W. (Energy Research)
Depositional environments of Mannville coals and associated sediments in Lloydminster heavy oil area, Saskatchewan, $3,000.00.

University of Saskatchewan

Braun, W.K. (Geology)
Biostratigraphy and ostracode faunas of Upper Devonian formations, Rocky Mountains region, $3,000.00.
Hajnal, Z. (Geology)
Athabasca Basin physical properties, $10,000.00.

MANITOBA

University of Manitoba

Ayres, L.D. (Earth Sciences)
Volcanologic and sedimentologic investigation of subaqueous and subaerial Proterozoic flows and fragmental rocks, Amisk Lake, Saskatchewan, $6,000.00.
Cerney, P. (Earth Sciences)
Geochemistry of Nb-Ta ore minerals in granitic pegmatites, $6,000.00.
Last, W.M. (Earth Sciences)
Geology of sodium sulfate deposits in the Plains of Western Canada, $5,000.00.

ONTARIO

Carleton Universtiy

Brown, R.L. (Geology)
Investigation of structural style in the Cariboo Mountains, southern British Columbia, $11,400.00.
Michel, F.A. (Geology)
Nature and history of ground ice, central Yukon, $9,700.00.
Watkinson, D.H. (Geology)
Geochemistry of precious metal concentrations in some Ni-Cu-PGE and Cu-Zn-Ag-An deposits, $7,500.00.
Yole, R.W. (Geology)
Petrography, diagenesis and reservoir properties of sandstones of the Parsons Group (Lower Cretaceous), Mackenzie Delta area, $6,000.00.

MacMaster University

Crocket, J.H. (Geology)
Rare earth elements as aids to mineral exploration for Archean volcanic hosted gold deposits, $7,000.00.
Ford, D.C. (Geography)
Stable isotope studies of the massive sulfide deposits, wall rocks, and contained ground ice at Nanisivik Zinc/Lead Mine, Baffin Island, $7,500.00.
Kramer, J.R. (Geology)
Trace metal – humics – metal oxides – interactions in an estuarine enviroment, $15,000.00.
McNutt, R.H. (Geology)
Geochronology, petrology and chemistry of metaigneous bodies, Parry Sound area, Grenville Province, Ontario, $5,000.00.
Thode, H.G. (Chemistry)
Sulphur and carbon isotope ratios in Canadian banded iron formations, $5,000.00.

University of Ottawa

Papantonopoulis, C.I. (Civil Engineering)
Analysis of rock slopes by the generalized limit equilibrium method (the energy approach), $9,000.00.

Queen's University

Dalrymple, R.W. (Geology)
Sedimentation and bedform mobility on Sable Island Bank, $12,000.00.

Royal Ontario Museum

Collins, D.H. (Invertebrate Paleontology)
Distribution, composition and stratigraphy of Burgess Shale faunas in the Stephen Formation, British Columbia, $4,000.00.
Wicks, F.J. (Mineralogy and Geology)
Mineralogy and geochemistry of the chrysotile asbestos deposits of the Eastern Townships, Quebec, $7,500.00.

University of Toronto

Bailey, R.C. (Physics)
Geologic interpretation with borehole gamma-ray spectrometer data, $8,750.00.
Campbell, I.H. (Earth Sciences)
Rare earth elements in acid volcanics associated with massive Cu-Zn sulfide mineralization, $7,500.00.
Campbell, I.H. (Earth Sciences)
Factors controlling the solubility of chromite in silicate liquids, $5,000.00.
Cunlop, D.J. (Physics)
Thermal and chemical remagnetization a guide to tectonic and metamorphic history, $5,000.00.
Edwards, R.N. (Physics)
Controlled source electromagnetic sounding of the sea floor, $7,750.00.
Halls, H.E. (Geology)
Paleomagnetic and fabric studies of igneous rocks from the Sverdrup Basin, $7,700.00.
Naldrett, A.J. (Earth Sciences)
Activity-composition relations of Ni, Cu and Pt in silicate melts and the segregation of magmatic sulfide ores, $10,000.00.
Norris, G. (Geology)
Triassic palynostratigraphy of the eastern Sverdrup Basin, Arctic Canada, $4,000.00.

University of Western Ontario

Mereu, F.J. (Geophysics)
Seismic studies of subsurface structure of the crust and upper mantle of the Canadian Shield using COCRUST data, $7,200.00.

QUEBEC

Concordia University

Kumarepeli, S. (Geology)
Petrochemistry, age and tectonic significance of Tibbit Hill Volcanics, $4,000.00.

École Polytechnique

Bazinet, R. (Génie minéral)
Magnétolleurique haute fréquence, $17,500.00.
Tanguay, M.G. (Génie minéral)
Application des images Landstat en génie et en géologie – étude d'évaluation des images SAR en géologie, $15,000.00.

Université de Laval

Azzaria, L.M. (Géologie)
Mercury compounds in wall rocks as a guide to gold mineralization at Sigma Mines, Val d'Or, Québec, $5,800.00.
Habashi, F. (Mines et Métallurgie)
The recovery of uranium from phosphate rock, $7,000.00.
Seguin, M.K. (Géologie)
Paléomagnétisme et datation par méthode radiogénique des dykes de diabase de la région est de la péninsule de Gaspé, $5,700.00.
Seguin, M.K. (Géologie)
Levés gravimétriques de détail dans la région de Baie St. Paul, Québec: corrélation avec la géologie structurale et la séismicité de cette région, $2,500.00.

McGill University

Bird, J.B. (Geography)
The stability of marine cliffs in surficial sediments in an arctic environment, $9,000.00.
Francis, D. (Geology)
Tectonics and volcanism of the La Grande Greenstone belt, $8,000.00.
Hesse, R. (Geology)
Fluid inclusions as paleothermometers and paleobarometers in the Québec Appalachians, $4,000.00.
Mountjoy, E.W. (Geology)
Structure and metamorphism of the footwall of the Purcell thrust adjacent to the Malton gneiss in the western Selwyn Mountains, eastern British Columbia (parts of 8308 $W_{\frac{1}{2}}$, 8307 NE corner and adjacent parts of 8309 and 10), $5,200.00.
Jensen, O.G. (Mining)
Geophysical applications of VHF-EM waves and fields, $17,500.00.

Université de Montréal

Gray, J.T. (Geography)
Geothermal modelling of deep drill hole data aimed at reconstruction of late Quaternary environments in northern Québec and Gaspésie, $5,700.00.
Ludden, J. (Géologie)
The evolution of the southern section of the Abitibi belts: an integration of geological studies, $5,600.00.
Mamet, B.L. (Géologie)
Carboniferous foraminifers and algae, British Columbia, Yukon and Districts of Mackenzie and Franklin, $5,000.00.
Richard, P.J.H. (Géographie)
Project Témiscamingue chronopalyno-stratigraphie, Chronologie ^{14}C, Déglaciation, $9,500.00.

Université du Québec à Chicoutimi

Dimroth, E. (Sciences de la Terre)
Volcanologie physique et sédimentologie de la région de Chibougamau-Chapais, $5,000.00.

Guha, J. (Sciences de la Terre)
Caractérisation des phases fluides associée à la minéralisation dite "type porphyre" du canton Obalske, Chibougamau, $5,000.00.
Woussen, G. (Sciences de la Terre)
Evolution magmato-tectonique de la province Grenville dans la région du Saguenay – Lake St-Jean-Basse Côte-Nord, $8,000.00.

Université du Québec à Montréal

Occhietti, S. (Géographie)
Application de l'aminostratigraphie au quaternaire de l'Arctique occidental et de la région atlantique du Canada, $7,000.00.
Prichonnet, G.P. (Sciences de la Terre)
Caractérisation des tills et des écoulements glaciaires wisconsiniens dans le sud-ouest du Québec, $7,000.00.

NEW BRUNSWICK

University of New Brunswick

Williams, P.F. (Geology)
Geological mapping in eastern Notre Dame Bay, $5,000.00.

NOVA SCOTIA

Dalhousie University

Boyd, R. (Geology)
Transgression coastal sedimentation on the eastern shore of Nova Scotia, $7,500.00.
Huntley, D.A. (Oceanography)
Velocities stresses and sediment movement at the seabed, $12,000.00.
Jamieson, R.A. (Geology)
Cape Breton highlands geological mapping, $8,000.00.
Ryall, P.J.C. (Geology)
Development of a deep-towed reconnaissance vehicle using a two-part two system, $6,250.00.
Scott, D.B. (Geology)
Holocene sea-level rise and the Pleistocene-Tertiary boundary on Sable Island, Nova Scotia, $12,000.00.

St. Mary's University

Pe-Piper, G. (Geology)
Mesozoic-Cenozoic volcanicity of the eastern North American continental margin, $5,500.00.

Acadia University

Barr, S.M. (Geology)
Mineralization associated with granitoid intrusions, Cape Breton Island, Nova Scotia, $6,000.00.

Nova Scotia Research Foundation

Bidgood, D.E.T. (Geophysics)
The detection of abandoned shallow underground coal mine workings by geophysical methods, $5,000.00.

NEWFOUNDLAND

Memorial University of Newfoundland

Barnes, C.R. (Earth Sciences)
Conodont biostratigraphy and paleoecology of the Cow Head Group (Cambro-Ordovician), Western Newfoundland, $3,500.00.
Fryer, B.J. (Earth Sciences)
The geochemistry of crustal reworking, Hopedale Block, Labrador, $6,000.00.
Hay, A.E. (Physics)
Acoustic remote sensing and the sedimentology of Arctic fjords, $10,000.00.
Hiscott, R.N. (Earth Sciences)
Basin analysis of Conception Group, upper Proterozoic, Avalon Peninsula, $3,000.00.
Macpherson, J. (Geography)
Palynological investigations, Newfoundland, $9,000.00.
Rivers, T. (Earth Sciences)
Geological and geochronological investigations in the Grenville Front region coast of Labrador, $8,000.00.
Rogerson, R.J. (Geography, Earth Sciences)
Glacial geology of the Selamuit Range, Torngat Mountains, Labrador, $8,500.00.
Williams, H. (Earth Sciences)
Geology of Lomond Map area (12H/5) with extensions northward to complete coverage of the entire Humber Arm Allochthon, $6,000.00.

Department of Environment Canada, Water Resources Research Support Program, Research Agreements 1983-84/Ministère des Environnement Canada, Programme de subvention à la recherche sur les ressources en eau, conventions de recherche 1983-84

Memorial University of Newfoundland
Gale, J.E. (Earth Sciences)
Assessment of physical and chemical controls on groundwater and contaminant velocities in fractured porous rock aquifers, $20,000.00.

University of Waterloo

Barker, J.F. (Earth Sciences)
Aspects of biodegradation and adsorption in the transport of volatile organics in groundwaters at a special waste disposal site, $20,000.00.

**Department of Indian and Northern Affairs Canada, Research Contracts 1983-84/
Ministère de les Affaires Indiennes et du Nord Canada, contracts de recherche 1983-84**

ALBERTA

University of Alberta

Jones, B. (Geology)
Geological mapping of the Cape Crauford Formation on the Brodeur Peninsula, $5,000.00.
Lambert, R.St.J. (Geology)
Structure and evolution southeast Slave – north shore McLeod Bay, $5,000.00.
Smith, D.G. (Geology)
Tsu Lake geochemistry – Fort Smith, $6,000.00.
Smith, D.G. (Geology)
Preliminary account of the Blackford Lake alkiline complex, $2,000.00.

MANITOBA

University of Manitoba

Cerny, P. (Earth Sciences)
Rare element pegmatites – Yellowknife Basin, $10,000.00.

ONTARIO

Carleton University

Donaldson, J.A. (Geology)
Stratigraphy and sedimentology of the Thelon Formation – Dubawnt Basin, N.W.T., $10,000.00.
Structure and sedimentology and evolution of Nonacho Basin, N.W.T. $7,500.00.
Moore, J. (Geology)
Mapping project in the Calder River area, $8,000.00.

University of Ottawa

Dixon, O.A. (Geology)
Stratigraphy and sedimentology of the Imperial and Canol Formations, $5,000.00.
Fyson, W.K. (Geology)
Structure Salve Province – mainly YK Supra Basin, $3,500.00.

Hogarth, D. (Geology)
Mapping Frobisher's Mine, Frobisher Bay, Ellesmere Island, $3,000.00.
St.-Onge, D.A. (Géographie)
Mapping Quaternary deposits, Richardson River Basin, Coppermine Valley, $5,800.00.

Queen's University

Helmstaedt, H. (Geological Sciences)
Yellowknife volcanic belt project, $7,500.00.

University of Toronto

Goodwin, A.M. (Geology)
Petrogenesis of Slave Province volcanic belts, $7,500.00.

U.S.A.

University of Kansas

Van Schmus, R. (Geology)
Geochronology project in Slave (Yellowknife and Anialuk River areas), $8,000.00.

Polar Continental Shelf Project Field Support Non-Governmental Activities 1983-84/Aide de l'étude du Plateau continental polaire en faveur d'activités non gouvernementales pour 1983-84

ALBERTA

University of Alberta

England, J., Bradley, R.S.
Glacial geomorphology, northern Ellesmere Island, District of Franklin.
Jones, B.
Sedimentology and paleontology, Prince of Wales Island, Brodeur Peninsula, Baffin Island and Bathurst Island, District of Franklin.

NORTHWEST TERRITORIES

Nanisivik Mines

Sutherland, R.
Mineralogy, Borden Peninsula, Baffin Island, District of Franklin.

ONTARIO

Lakehead University

Kissen, S.
Pb and Zn in carbonates, Nanisivik, Polaris, Baffin and Little Cornwallis Islands, District of Franklin.

McMaster University

McCann, S.B.
Coastal geomorphology and sedimentology, eastern Ellesmere Island, District of Franklin. Quaternary geology, Cornwallis Island, District of Franklin.

Woo, M.
Hydrology, Baker Lake, District of Keewatin.

University of Ottawa

French, H.M.
Geomorphic proceses, southwest Banks Island, Hooper Island, District of Franklin.

University of Toronto

Hails, H.C.
Paleomagnetics, Axel Heiberg Island, District of Franklin.
Lewkowicz, A.G.
Permafrost, southwestern Banks Island, District of Franklin.
Ritchie, J.C.
Lake sediments, Banks Island, District of Franklin.
Schwerdtner, W.M.
Stratigraphy, Axel Heiberg Island, District of Franklin.

University of Western Ontario

Harry, D.G.
Geomorphology, Sachs Habour, Banks Island, District of Franklin.
Lenz, A.C.
Paleontology, Lowther, Cornwallis and Bathurst Islands, District of Franklin.
Young, G.M.
Sedimentology, Victoria Island, District of Franklin.

U.S.A.

University of Northern Arizona

Elliott, D.K.
Stratigraphy and paleontology, Somerset and Prince of Wales Islands, District of Franklin.

University of Washington

Washburn, A.L.
Periglacial features, Resolute, Cornwallis Island, District of Franklin.

GERMANY

Heidelberg University

King, L.
Physical geography and geomorphology, Hare Fiord, Ellesmere Island, District of Franklin.

Ontario Geological Survey, Geoscience Research Grants 1983-84/ Commission géologique de l'Ontario subventions de recherche en sciences de la terre pour 1983-84

Brock University

Brand, U.
Source rock geochemistry of the Pleistocene Tills of southern Ontario, $9,800.00.

Carleton University

Donaldson, J.A.
Sedimentary rocks and strata-bound mineralization in the Cobalt Region of northeastern Ontario, $27,400.00.
Watkinson, D.H.
Platinum group element potential in alkaline rocks of northwestern Ontario, $5,000.00.

McMaster University

Crocket, J.H.
Genesis of Precambrian iron formations – links with base and precious metal mineralization in northeastern Ontario, $34,265.00.

Queen's University

Dalrymple, D.W.
Sedimentology of the Cambro-Ordovician Sandstones of eastern Ontario, $22,025.00.
Summers, J.M.
Deformation studies in Dome and McDonough Townships, Red Lake, $21,400.00.

Woods, D.V.
Seismic reflection investigation of the Paleozoic-Precambrian unconformity in eastern Ontario, $22,200.00.

University of Toronto

Barrett, T.
Resedimentation associated with gold-bearing banded iron formation in north-central Ontario, $5,600.00.
Edwards, R.N.
Cross-hole magnometric resistivity, northeastern region, $28,260.00.
Evenson, N.M.
Petrogenesis of mineralized horizons in Uchi Lake Greenstones in northwestern Ontario, $28,550.00.
Naldrett, A.J.
Platinum group elements in layered intrusions in northwestern Ontario, $16,350.00.
Schwerdtner, W.M.
Structural signature and tectonic history of deformed gold-bearing rocks in northwestern Ontario, $33,920.00.
Strangway, D.W.
Surface electromagnetic mapping in selected positions of Northern Ontario, $61,600.00.
Van Loon, J.C.
Direct trace elemental analysis of solid samples by techniques of atomic spectrometry, of general application, $15,380.00.
Wicks, F.J.
Mineralogy and geochemistry of the chrysotile asbestos deposits of Northern Ontario, $26,140.00.

University of Waterloo

Barker, J.F.
Organic geochemistry of southwestern Ontario's possible oil shales, $20,460.00.
Farvolden, R.N.
Subsurface Quaternary stratigraphy using borehole geophysics in southwestern Ontario, $19,580.00.
Fritz, P.
Geochemical and isotopic investigations of the Salina Formation in central Ontario, $19,540.00.

University of Western Ontario

Edgar, A.D.
The petrology, geochemistry and economic potential of the Nipissing Gabbro in northeastern Ontario, $5,880.00.
Fyfe, W.S.
Stratigraphy and geochemistry of Northern Ontario carbonaceous deposits: Onikawana lignites and James Bay peats, $45,035.00.

University of Windsor

Holm, P.E.
Strength testing of reservoir strata in the Grimsby Formation (Lower Silurian) of southwestern Ontario, $7,040.00.

York University

Edwards, G.R.
The petrogenesis and metallagenesis of the Atikwa-Lawrence volcanic plutonic terrain in northwestern Ontario, $22,235.00.

Natural Sciences and Engineering Research Council Canada Strategic Grants 1983-84/Subventions thématiques données par le Conseil de recherches en sciences naturelles et en génie du Canada 1983-84

BRITISH COLUMBIA

University of British Columbia - Simon Fraser University

Calvert, S.E. (Oceanography) – Huntley, D.J. (Physics)
Geochemistry of oceanic ferromanganese nodules, $63,338.00.

Clowes, R.M. (Geophysics and Astronomy)
Studies of oceanic sediments and upper crust using telemetered sonobuoys and ocean bottom seismometers, $28,162.00.

Russell, R.D. (Geophysics and Astronomy), Watanabe, T. (Geophysics and Astronomy)
Application of theory of geophysical measurement to the development of field instrumentation, with emphasis on information theory approaches, $54,060.00.

ALBERTA

University of Alberta

Muehlenbachs, K. (Geology), Nesbitt, B.E. (Geology)
An integrated study of precious and base metal mobilization in hydrothermally altered oceanic crust, $71, 946.00.

ONTARIO

McMaster University

Walker, R.G. (Geology)
Reservoir geometry and prediction of shallow marine sandstones, Alberta, $58,480.00.

University of Toronto - University of British Columbia

Scott, S.G. (Geology), Barrett, T.J. (Geology) – Chase, R.L. (Geophysics and Astronomy)
Young seamounts of the northeast Pacific Ocean, $132,850.00.

West, G.F. (Physics)
Seismic tomography, $62,400.00.

University of Waterloo

Fritz, P., Barker, J.F., Frape, S.K., Reardon, E.J., Mayfield, C. (Earth Sciences)
Occurrence and genesis of methane on the Canadian Shield, $38,160.00.

QUEBEC

Université du Québec à Chicoutimi - INRS - Université Laval - Université du Québec à Montréal

Dimroth, E., Archambault, G., Carignan, J., Chown, E.H.M., Guha, J. (Sciences de la terre) – Héroux, Y., Schrijver, K. – Rocheleau, M. (Géologie et Minéralogie) – Goulet, N. (Géologie)
Modélisation des évolutions géologiques et métallogéniques de la ceinture Abitibi, $74,200.00.

NOVA SCOTIA

Dalhousie University

Beaumont, C. (Oceanography)
The development and thermal histories of continental margin sedimentary basins, $71,580.00.

Boyd, R. (Geology)
Models for coastal and continental shelf sedimentation from Sable Island Bank, $48,700.00

Hall, J.M., Robinson, P.T. (Geology)
Investigation of the hydrothermal systems responsible for the formation of massive sulphide ore bodies in the ocean crust, $53,472.00.

Huntley, D.A., Bowen, A.J. (Oceanography)
The movement of water and sediment near the sea bed, $58,006.00.

Ryall, P.J.C., Hall, J.M., Zentilli, M. (Geology)
Investigations of mid-ocean ridges and polymetallic sulfide deposits using an electric rock core drill, $95,200.00.

NEWFOUNDLAND

Memorial University of Newfoundland

Gale, B.J., Fryer, B.J., Macko, S.A., Strong, D.F. (Earth Sciences)
Groundwater flow systems in fractured crystalline rocks – application to mineral exploration and toxic waste disposal, $80,000.00.

Williams, H. (Earth Sciences)
Geophysical compilation maps of the Atlantic margin of North America, $48,719.00.

Natural Sciences and Engineering Research Council Canada Earth Science Operating Grants 1983-84/Conseil de recherches en sciences naturelles et en génie Canada sciences de la terre subventions pour dépenses courantes 1983-84.

DEPARTMENT UNIVERSITY UNIQ0/APPL0/GR0	
Achab,A. INRS-Géoress. Québec - INRS	Chitinozoaires de l'Ordovicien et du Silurien inférieur de Québec
Adamowski,K. Civil Engineering Ottawa	Stochastic modelling of the hydrologic cycle
Aldridge,K.D. Physics York	Laboratory studies in geophysical fluid dynamics
Allard,M. Géographie Laval	Les environnements côtiers de l'Hudsonie
Allen,J.R. Geology Toronto	1) Experimental and field studies in metamorphic & igneous petrology 2) Petrology of Ca-Al-rich inclusions in the Allende meteorite
Anderson,G.M. Geology Toronto	Metasomatic and ore-forming solutions
Anderson,H.R. Biology Memorial	Contributions to palaeontology and stratigraphy, mainly Newfoundland
Appleyard,E.C. Earth Sciences Waterloo	Element mobilities in metasomatic rocks
Armstrong,R.L. Geological Sciences British Columbia	Geochronometry of Cordilleran rocks and isotope studies of crustal evolution
Ayres,L.D. Earth Sciences Manitoba	Physical volcanology, stratigraphy, and geochemistry of Precambrian and Early Paleozoic volcanoes
Baadsgaard,H. Geology Alberta	Isotope geology of: Archean polymetamorphic rocks, pyroclastic beds, uranium deposits and salt beds
Baer,A.J. Science Ottawa	1) Structural studies in the Grenville Province 2) Evolution of Proterozoic orogene
Bailey,R.C. Physics/Geology Toronto	Electromagnetic sounding of the earth's crust and mantle
Bailey,W.G. Geography Simon Fraser	The role of atmospheric and surface factors in evaporation from cool surfaces
Ballivy,G. Génie civil Sherbrooke	Comportement des coulis d'étanchéité et de scellement dans le roc: ancrages, pieux, barrages
Barker,J.F. Earth Sciences Waterloo	Aspects of organic and bio-geochemistry in the groundwater environment
Barnes,C.R. Earth Sciences Memorial	Conodont taxonomy, biostratigraphy, paleoecology, and biogeography
Barr,S.M. Geology Acadia	Petrology, petrogenesis, and economic potential of igneous rocks from southern Nova Scotia, Cape Breton Island and Thailand

Bayliss,P. Geology & Geophys. Calgary	Applied crystallographic-mineralogy	Brand,U. Geological Sciences Brock	Carbonate diagenesis and metals and hydrocarbon exploration geochemistry
Bazinet,R. Génie minéral Ecole Polytechnique	Prospection magnétotellurique	Braun,W.K. Geological Sciences Saskatchewan	Microfaunas and biostratigraphy of Western Canada
Beales,F.W. Geology Toronto	Stratigraphy and stratabound mineral deposits	Brookes,I.A. Geography York	Sea level & glacial history, W. Newfoundland: Geomorphological & micropalaeontological approaches
Beaumont,C. Oceanography Dalhousie	Earth rheology and geodynamics	Brookfield,M.E. Land Resource Sc Guelph	Studies of recent and ancient desert deposits
Beck,A.E. Geophysics Western Ontario	Geothermal problems, pure and applied	Brooks,C. Geology Montréal	Isotopic and chemical studies of early crustal processes in the Precambrian Shield of Canada
Bell,K. Geology Carleton	Isotope geochemistry of carbonatites	Broughton,R.S. Agricult. Eng. Macdonald Coll.	An analysis of the effects of drainage works on downstream flood peaks
Berraja,M. Géographie Québec-Montréal	Impacts de l'utilisation du sol sur les différentes composantes du bilan hydrologiques (quantité-qualité)	Brown,A.C. Génie minéral Ecole Polytechnique	1) Etudé métallogénique des gisements stratiformes de métaux non-ferreux 2) Metallogenic studies of stratiform non-ferrous metal deposits
Berwick,A.E. Geology Laurentian	Geochemical characteristics of precambrian volcanism and the nature of the upper mantle	Brown,E.L. Geology Carleton	Structural investigations in the Canadian Cordillera
Binda,P.L. Geology Regina	1) Stratiform copper occurrences of the Belt in Alberta and British Columbia 2) Depositional environment of the Battle Formation in Saskatchewan	Brown,E.H. Earth Sciences Waterloo	A study of uranium isotope disequilibrium in the Pre-Cambrian environment
Bland,C.J. Physics Calgary	Investigations in disequilibrium in uraniferrous soil, rock and water	Bryan,R.B. Geography Toronto	Erodibility of soils and erosion processes in laboratory and badland areas
Blenkinsop,J. Geology Carleton	Rb-Sr and Sm-Nd investigations of the crust and upper mantle	Burwash,R.A. Geology Alberta	Relict archean terrains in the Western Churchill Province
Bonn,F.J. Géographie Sherbrooke	Télédétection des propriétés thermiques de la surface de la terre	Bustin,R.M. Geological Sciences British Columbia	Structure, sedimentology, and petrology of coal measures in western and Arctic Canada
Borradaile,G.J. Geology Lakehead	Structural and metamorphic geology with emphasis on Archean rocks of NW Ontario	Caldwell,W.G.E. Geological Sciences Saskatchewan	Biostratigraphic studies in the cretaceous system of western Canada
Bouchard,M.A. Géologie Montréal	Pétrographie et morphologie du till, région de Chibougamau-Lac Mistassini, Québec	Calon,T.J. Geology Memorial	Structural studies of ophiolites and associated rocks
Bourque,P. Géologie Laval	Analyse paléo-environnementale des ensembles à carbonates du Siluro-Dévonien du Bassin de Gaspésie	Calvert,S.E. Oceanography British Columbia	Geochemistry of recent marine sediments
Bovis,M.J. Geography British Columbia	Slope movement in southwest British Columbia	Cameron,B.W. Geology Acadia	Evolution, paleoecology and forth distribution of fossil marine microbial endoliths
Bowen,A.J. Oceanography Dalhousie	Dynamics of waves, currents and sediments	Campbell,F.A. Geology & Geophys. Calgary	Geochemistry, mineralogy, and isotope studies of rocks and ores
Boyd,R. Geology Dalhousie	Coastal sediment dispersal and Holocene Age structure, Eastern Nova Scotia	Campbell,I.A. Geography Alberta	Runoff, sediment yields and partial area contributions in badlands

Campbell,I.H. Earth/Planet. Sci. Toronto	Activity coefficients in silicate liquids
Cannon,W.H. Earth Sciences York	The application of long baseline interferometry to geodesy and geophysics-system development
Carmichael,C.M. Geophysics Western Ontario	Geomagnetism
Carmichael,D.M. Geological Sciences Queen's	Metamorphic studies in Canada
Carroll,R.L. Redpath Museum McGill	Evolution and functional anatomy of Paleozoic and Early Mesozoic reptiles
Cerny,P. Earth Sciences Manitoba	Mineralogy, petrology, and genesis of granitic pegmatites
Chao,G.Y. Geology Carleton	1) Mineralogy of the nepheline syenite, Mont St.-Hilaire, Québec 2) Phase relations in the system Pt-Pd-Te-Sb
Chapman,C.H. Physics Toronto	Seismic body wave theory
Charlesworth,H.A.K. Geology Alberta	Structural study of coal-bearing and adjacent strata,Rocky Mountain Foothills, central Alberta
Chatterton,B.D.E. Geology Alberta	Taxonomic, paleoecologic, biostratigraphic and biogeographic studies of Paleozoic faunas of western and northern Canada, with concentration on conodonts and trilobites
Cherry,J.A. Earth Sciences Waterloo	1) Groundwater origin, age and diffusion effects in thick clayey deposits 2) Contaminant plume development in unconfined sand aquifers
Chesworth,W. Land Resource Sc Guelph	Geochemistry of soil-forming processes
Church,M.A. Geography British Columbia	Studies of the hydraulics of alluvial rivers
Church,W.R. Geology Western Ontario	Evolution of ophiolite-bearing proterozoic and paleozoic orogenic systems
Churcher,C.S. Zoology Toronto	Quaternary mammalian faunas, especially of Canada and Africa
Clark,A.H. Geological Sciences Queen's	Origin and delimitation of metallogenetic provinces and domains at convergent lithosphere plate boundaries
Clark,G.S. Earth Sciences Manitoba	Rubidium-strontium geochronology of Archean orthogneiss and middle Proterozoic plutonism Churchill Province, Northern Manitoba
Clarke,D.B. Geology Dalhousie	Petrogenesis of igneous rocks: 1) Peraluminous granites 2) Kimberlites and K-sulphides 3) Basic volcanic rocks
Clarke,G.K.C. Geophys./Astron. British Columbia	Glaciology: field study, theory and instrumentation
Clarke,W.B. Physics McMaster	Investigations of isotope patterns in nature
Clowes,R.M. Geophys./Astron. British Columbia	Reflection/refraction seismology on land and at sea for crustal/upper mantle investigations
Cogley,J.G. Geography Trent	Palaeoclimate and global tectonics
Collins,D.M. Zoology Toronto	Distribution, composition and inter-relationships of Burgess Shale faunas
Cook,F.A. Geology & Geophys. Calgary	Seismic reflection profiling in the southern Canadian cordillera
Cooke,R.C. Oceanography Dalhousie	Reactions of gaseous, dissolved and particulate carbon in the sea
Copper,P. Geology Laurentian	Paleoecology, evolution and morphology of Ordovician to Devonian atrypoid brachiopods; ecological succession in reefs
Crocket,J.H. Geology McMaster	Applications of geochemistry to mineral deposit genesis
Crossley,D.J. Mining/Metal. Eng. McGill	1) Physics of the earth's interior 2) Exploration geophysics
Cruden,D.M. Geology Alberta	Stability of natural slopes in rock
Cumming,G.L. Physics Alberta	Systematics of PB isotope variations in ores and rocks - crustal seismic reflection and refraction studies
Curran,J.H. Civil Engineering Toronto	Constitutive equations for porous geologic materials
Dalrymple,R.W. Geological Sciences Queen's	Sediment dynamics of Cobequid Bay and Sable Island Bank
D'Anglejan,B.F. Oceanography McGill	P geochemistry and P-Fe relationships in estuaries
David,M. Génie minéral Ecole Polytechnique	Développements géostatistiques pour l'inventaire et l'exploitation optimum des réserves
David,P.P. Geology Montréal	Study of eolian deposits in Canada
Davidson-Arnott,R.G.D. Geography Guelph	Beach and nearshore processes - erosion and sedimentation

Davis,A.M. Geography Toronto	Chronology and paleoecology of peatlands in Newfoundland
Deutsch,E.R. Physics Memorial	Rock magnetism and geological structure in the Newfoundland region
Dickinson,W.T. Engineering Guelph	Changes in hydrologic regime
Dimroth,E. Sc. appliquées Québec-Chicoutimi	1) Volcanologie physique et sédimentologie d'une ceinture volcano-sédimentaire Archéenne 2) Evolution magmato-tectonique de la Province Grenville au Saguenay-Lac-St-Jean
Dionne,J. Géographie Laval	Evolution des rives du Saint-Laurent: estuaire et golfe (secteur du Québec)
Dixon,J.M. Geological Sciences Queen's	Centrifuge model and field studies in tectonics, and geotectonics of the Pacific basin and its margins
Dixon,O.A. Geology Ottawa	Ordovician-devonian invertebrate fossils and sedimentary facies
Doig,R. Geological Sciences McGill	Geological applications of isotopic analyses, seismic hazard
Donaldson,J.A. Geology Carleton	Comparative studies of Precambrian sedimentary rocks
Donnay,G. Geological Sciences McGill	Relation of physical and chemical properties to crystal structure
Dosso,H.W. Physics Victoria	Geomagnetic variations and electromagnetic modelling
Dostal,J. Geology Saint Mary's	Geochemical studies of non-orogenic volcanic rocks
Drake,J.J. Geography McMaster	Long-term significance of present geomorphic and hydrologic process rates
Dreimanis,A. Geology Western Ontario	Origin of glaciogenic deposits and stratigraphy of last glaciation in south eastern Canada
Dudas,M.J. Soil Science Alberta	1) Biogeochemistry of arsenic in soils developed on acid shale 2) Seasonal dynamics in the natural abundance of mercury in soil
Dunlop,D.J. Physics Toronto	Rock magnetism and paleomagnetism of continental and submarine rocks and synthetic analogs
Dusseault,M.B. Earth Sciences Waterloo	Geomechanics of in situ processes
Edgar,A.D. Geology Western Ontario	Geochemistry and petrology of igneous rocks with particular reference to the mantle
Edmund,A.G. Geology Toronto	Osteology, stratigraphic relationships and systematic revision of giant armadillos and ground sloths: Study of certain Pleistocene Felidae
Edwards,G.R. Earth & Atmos. Sc. York	The geochemistry and evolution of two contrasting, archean volcanic-plutonic terrains, Northwestern Ontario
Edwards,R.N. Physics Toronto	Electromagnetic exploration at sea with controlled sources
Elias,R.J. Earth Sciences Manitoba	Ordovician solitary rugose corals of North America
Ellis,R.M. Geophys./Astron. British Columbia	Earthquake studies and refraction seismology
Elrick,D.E. Land Resource Sc Guelph	Transport phenomena in natural porous media
El-Sabh,M. Oceanography Québec-Rimouski	Circulation dynamics and mixing processes in the lower St. Lawrence estuary
Emery,W.J. Oceanography British Columbia	Short term variability of wind and sea surface temperature patterns as inferred from geostationary satellite data
England,J. Geography Alberta	Quaternary glaciation, glacio-isostasy and paleoclimatic change, Northern Ellesmere Island
Evans,L.J. Land Resource Sc Guelph	Phenolic acids and podzolisation
Evans,M.E. Physics Alberta	Quaternary paleomagnetism of Western Canada and archeomagnetic investigations
Evans,R.D. Environmental Stud. Trent	Lake sediments as indicators of anthropogenic lead deposition
Evensen,N.M. Geology Toronto	Analysis and modeling of isotopic variations in geologic systems
Fahey,B.D. Geography Guelph	Hydration and salt crystallization as rock weathering mechanisms in cold climates
Fahraeus,L.E. Earth Sciences Memorial	Conodontophorid paleobiology, histomorphology of conodonts and thelodont scales, and Lower Paleozoic chrono-and biostratigraphy
Farquhar,R.M. Physics Toronto	Lead isotope ratio variations
Farrar,E. Geological Sciences Queen's	Plate tectonic evolution of the Pacific Ocean basin and its margins - Kar geochronology and paleomagnetism
Farvolden,R.N. Earth Sciences Waterloo	Groundwater flow in a stratified reservoir under pumping stress

Fawcett,J.J. Geology Toronto	Experimental and field based studies in igneous and metamorphic petrology
Feininger,T. Geology Laval	Comparative petrology and tectonic history of the Quebec Appalachians and the Ecuadorian Andes
Ferguson,R.B. Earth Sciences Manitoba	Crystal-chemical and petrogenetic studies of the rock-forming feldspars and other minerals
Filion,L. Géographie Laval	Dynamique holocène des systèmes éoliens du Québec
Finn,W.D. Soil Dynamics British Columbia	Behaviour of ground and structures under wave and earthquake loading, moving boundary problems, pollution dispersal
FitzGibbon,J.E. Geography Guelph	Water balance and runoff response of the litter layer
Fleet,M.E.L. Geology Western Ontario	Crystal chemical and geochemical studies on earth materials
Ford,D.C. Geography McMaster	1) Groundwater flow and cavern genesis in soluble rocks 2) Quaternary dating & palaeothermometry of calcite speleothem 3) Karst studies in Canada
Fox,R.C. Geology/Zoology Alberta	Late Cretaceous and Early Tertiary tetrapods from western Canada
Francis,D.M. Geological Sciences McGill	Origin and evolution of basic magmas in the upper mantle
Franklin,J.A. Earth Sciences Waterloo	Engineering applications of rock mechanics
Frape,S.K. Earth Sciences Waterloo	Origin and evolution of saline groundwaters and associated gases within the Canadian Shield
Fredlund,D.G. Civil Engineering Saskatchewan	Engineering behavior of expansive soils
Freeze,R.A. Geological Sciences British Columbia	Groundwater in geological processes
French,H.M. Geology/Geography Ottawa	Geomorphic and permafrost studies, Banks Island and northern interior Yukon
Frind,E.O. Earth Sciences Waterloo	Mathematical modelling of flow and transport in hydrogeologic systems
Fritz,P. Earth Sciences Waterloo	Isotopic hydrology and isotope geochemistry, paleohydrology and paleoenvironments
Fryer,B.J. Earth Sciences Memorial	The application of elemental and isotopic geochemistry to studying continental crustal processes and their associated mineral deposits
Fyfe,W.S. Geology Western Ontario	Chemical transport processes in geological fluids
Fyson,W.K. Geology Ottawa	Structural patterns in metamorphic rocks
Gagnon,M.J. Sci. fondamentales Québec-Chicoutimi	Rôle des résidus ligneux dans le transport des ions métalliques
Gale,J.E. Earth Sciences Memorial	Factors controlling the movement of fluids through fractured argillaceous and crystalline rocks
Gardner,J.S. Geography Waterloo	Contemporary and recent sediment transfers in a small mountain basin
Garrett,C.J.R. Oceanography Dalhousie	Physical oceanography
Gaskill,H.S. Math/Statistics Memorial	Sea ice and iceberg motion
Gauthier,M. Sciences de la terre Québec-Montréal	Gîtologie et métallogénie des métaux usuels au Québec
Gelinas,L. Géologie Montréal	Géochimie et pétrogénèse des empilements volcaniques de l'Archéen en relation avec les gisements de sulfures massifs
Geurts,M.A. Géographie Ottawa	Palynostratigraphie et variations climatiques tardiglaciaires et postglaciaires
Ghent,E.D. Geology & Geophys. Calgary	Geochemical and petrologic study of metamorphism and diagenesis
Giblin,A.R. Geology Dalhousie	Coal, oil shale and hydrocarbon resources of Atlantic Canada
Gibson,I.L. Earth Sciences Waterloo	Petrological and ore-forming processes in extensional regimes
Gilbert,R. Geography Queen's	Glaciomarine sedimentary processes in Arctic fiords
Gill,D.E. Génie minéral Ecole Polytechnique	Le poinçonnement des roches en place
Gillham,R.W. Earth Sciences Waterloo	Implications of the capillary fringe in the hydraulic and geochemical interactions of groundwater and surface water
Gittins,J. Geology Toronto	Petrogenesis of alkalic rocks and carbonatites, related ores and the underlying mantle
Godwin,C.I. Geological Sciences British Columbia	Application of galena and rock lead isotope analyses to metallogeny of the Canadian Cordillera

Goodchild,M.F. Geography Western Ontario	Generalization and error in cartography and geographical data processing	Hall,R.L. Geology & Geophys. Calgary	Lithostratigraphy and biostratigraphy of the Fernie Formation (Jurassic), Alberta
Goodwin,A.M. Geology Toronto	Archean volcanic petrogenesis and early crustal growth	Halls,H.C. Geology Toronto	Paleomagnetism of Precambrian rocks
Gorton,M.P. Geology Toronto	Geochemical study of rocks from East Greenland	Hanes,J.A. Geological Sciences Queen's	Cooling history of orogens by thermochronometric and petrologic studies
Gough,D.I. Physics Alberta	Magnetometer array studies and paleomagnetism	Hare,F.K. Geography Toronto	Coupled modelling of climate, ocean and cryosphere
Gravenor,C.P. Geology Windsor	Pleistocene and pre-pleistocene glaciomarine sedimentation	Harris,S.A. Geography Calgary	Alpine environmental studies
Gray,D.M. Agricult. Eng. Saskatchewan	Simulation of hydrological processes	Harry,D.G. Geography Western Ontario	Quaternary geomorphology and permafrost studies, Banks Island
Gray,J. Physics Alberta	Stable isotope studies of fluid inclusions in minerals	Hay,A.E. Physics Memorial	Coastal and continental shelf oceanography
Gray,J.T. Geography Montréal	Permafrost studies & geothermal modelling in Northern Quebec & Gaspésie	Hay,J.E. Geography British Columbia	Determination of the radiance distribution for the sky hemisphere using radiometric and photometric techniques
Greenhouse,J.P. Earth Sciences Waterloo	Geophysical mapping of contaminant plumes	Hayatsu,A. Geophysics Western Ontario	Study of initial argon by K-Ar isochron method
Greenwood,B. Geography Toronto	Coastal hydrodynamics and sedimentation	Hein,F.J. Geography Alberta	Sedimentary models for modern and ancient mass-flow deposits in slope-dominated settings
Greenwood,H.J. Geological Sciences British Columbia	Geological phase equilibrium studies	Helmstaedt,H. Geological Sciences Queen's	Fabrics of metamorphic rocks, tectonic settings of mineral deposits, Kimberlites and their xenoliths
Grill,E.V. Oceanography British Columbia	The geochemistry of trace heavy metals in marine waters and sediments	Hendershot,W.H. Geography Montréal	Genesis and classification of cryosols
Grundy,H.D. Geology McMaster	Mineralogy of the framework silicates	Heroux,Y. INRS-Géoress. Québec - INRS	Relations entre l'évolution thermique des kéroghnes et la géologie structurale des Appalaches du Québec
Guha,J. Sc. appliquées Québec-Chicoutimi	Rôle des fluides mobilisateurs dans les qîtes filoniens et porphyres Archéens	Hesse,P.R. Geological Sciences McGill	Evolution of sedimentary basins on modern and ancient continental margins (diagenesis and low-grade metamorphism, tectonic setting)
Gwyn,Q.H.J. Géographie Sherbrooke	Stratigraphie et chronologie quaternaires, golfe du Saint-Laurent, Québec	Hicock,S.R. Geology Western Ontario	Glacial geology applied to mineral exploration in mountainous terrain
Hajnal,Z. Geological Sciences Saskatchewan	1) Seismic investigation of deep seated structures in Saskatchewan 2) Seismic investigation of Precambrian contact zones	Hill,A.R. Geography York	Nitrate-nitrogen flux and cycling in rivers
Hall,D.H. Earth Sciences Manitoba	Characteristics and development of crustal magnetic units in Manitoba and North-Western Ontario	Hillaire-Marcel,C. Sciences de la terre Québec-Montréal	Paleoenvironnements isotopiques continentaux et paleoclimats
Hall,J.K. Geology Dalhousie	The nature, structure and history of oceanic crust through drilling, geological and geophysical investigations	Hills,L.V. Geology & Geophys. Calgary	Palynology, clastic sedimentology and Quaternary research

Biscott,R.N. Earth Sciences Memorial	Sedimentation along ancient continental margins
Hodgson,C.J. Geology Queen's	Metallogenic studies of Canadian ore-bearing environments
Hodych,J.P. Earth Sciences Memorial	Effect of stress on magnetization of rock; paleomagnetism of appalachian Newfoundland
Hofmann,H.J. Geology Montréal	Precambrian and Lower Proterozoic paleontology and stratigraphy
Hogarth,D.D. Geology Ottawa	Petrogenesis of certain alkalic rocks and carbonatites
Holm,P.E. Geology Windsor	Fold generations, cleavages, and tectonic history of the Bancroft-Madoc area, Ontario
Hopkins,J.C. Geology & Geophys. Calgary	Sedimentation and diagenesis of Mesozoic hydrocarbon-bearing sandstones
Howard,K.W.F. Physical Science Toronto	The use of minor ions as indicators of groundwater origin in quaternary deposits of southern Ontario
Howarth,P.J. Geography McMaster	Development and applications of Landsat analytic methodology for the physical environment
Hron,F. Physics Alberta	Numerical modelling of seismic waves in structurally complicated media
Huntley,D.A. Oceanography Dalhousie	Nearshore and boundary layer dynamics
Hutcheon,I.E. Geology & Geophys. Calgary	Geochemistry and water-rock interaction: Theoretical and applied to economic problems
Hutchinson,R.W. Geology Western Ontario	Geology, origin and metallogenic relationships of exhalative ore deposits
Hynes,A.J. Geological Sciences McGill	Precambrian tectonic studies: Capricorn Orogen and James Bay
Ingram,R.G. Oceanography McGill	Effect of environmental changes on estuarine circulation and mixing
Jacobs,J.D. Geography Windsor	Paleoenvironments of the Frobisher Bay Area, Baffin Island, NWT
James,N.P. Earth Sciences Memorial	Facies anatomy and diagenetic evolution of early paleozoic carbonates
Jamieson,R.A. Geology Dalhousie	1) Emplacement of ophiolites 2) The Avalon Zone in Nova Scotia
Jensen,O.G. Mining/Metal. Eng. McGill	Geophysical analysis/Earth mechanics
Johnson,P.G. Geography Ottawa	Paraglacial terrain development by mass movement processes. The control of hydrological systems
Jolly,W.T. Geological Sciences Brock	Igneous and metamorphic petrology of Huronian volcanic rocks, Ontario
Jones,B. Geology Alberta	Silurian-Devonian biostratigraphy of Western Canada and Arctic Canada
Jones,F.W. Physics Alberta	Electromagnetic induction, heat flow, and Earth tides and tilts
Jones,H.G. INRS - Eau Québec - INRS	Snow pack chemistry and melt water quality
Justice,J.H. Geology & Geophys. Calgary	Array processing in exploration seismology
Kaiser,P.K. Civil Engineering Alberta	Underground openings in soft, weak rock/mobile debris movements
Kanasewich,E.R. Physics Alberta	Geophysical investigations of the crust and upper mantle
Karakiewicz,B. INRS-Océanolog. Québec - INRS	Formation de systèmes de barres d'avant-côte sous l'action des houles progressives (Analyse du mécanisme théorique de formation et modélisation mathématique)
Karrow,P.F. Earth Sciences Waterloo	Quaternary stratigraphy and interglacial-interstadial environments
Kay,B.D. Land Resource Sc Guelph	Quantitative characterization of mass and heat transfer in freezing soils
Kelly,C.A. Biology Winnipeg	Production of alkalinity by sulfate reduction in acidified lakes * with J.W.M. Rudd(Winnipeg)
Kennedy,D.J. Geology Brandon	Ordovician conodont taxonomy and biostratigraphy
Kenney,T.C. Civil Engineering Toronto	Compacted soil liners to control contaminant migration
Kerrich,R. Geology Western Ontario	Thermal and volume history of Archaean oceans with geochemical implications
King,R.H. Geography Western Ontario	Soils as paleo-environmental indicators, Canadian Cordillera
Kissin,S.A. Geology Lakehead	Crystal chemistry and stabilities of sulphide minerals

Kobluk,D.R. Geology Toronto	Cavity-dwelling organisms in Paleozoic reefs
Kramer,J.R. Geology McMaster	Speciation and particulate interaction in natural waters
Krebes,E.S. Geology & Geophys. Calgary	Seismic waves in anelastic media
Kretz,R. Geology Ottawa	Studies in the geochemical migration of elements
Krogh,T.E. Geology Toronto	Research in geochronology: techniques, tests and applications to geological problems
Krouse,H.R. Physics Calgary	Stable isotope fractionation studies
Kukalova-Peck,J. Geology Carleton	Morphology and evolution of paleozoic insects with reference to phylogeny of recent insects
Kumarapeli,S. Geology Concordia	A metallogenic evaluation of the eastern extension of the Ottawa graben
Kyser,T.K. Geological Sciences Saskatchewan	Isotopic composition of the archaean mantle and ocean
Lajoie,J. Géologie Montréal	1) Sédimentologie de séquences archéennes de la région de Rouyn-Noranda 2) Sédimentologie de séquences aphébiennes de la région des monts Otish 3) Etudes sédimentologiques de roches volcanoclastiques
Lajtai,E.Z. Civil Engineering Manitoba	Fracture mechanisms in brittle rocks
Lambert,R.S.J. Geology Alberta	Radiogenic isotope studies in relation to crustal evolution
Langleben,M.P. Physics McGill	Thermal regime of sea ice
Langley,R.B. Surveying Eng New Brunswick	Applications of radio interferometry in geodesy and geodynamics
La Rochelle,P. Génie civil Laval	Propriétés fondamentales et comportement des argiles sensibles
Last,W.M. Earth Sciences Manitoba	Sedimentology and post-glacial history of saline lakes in Saskatchewan
Laurent,R. Géologie Laval	Géologie des complexes ophiolitiques des Appalaches du Québec
Lauriol,B.M.E. Géographie Ottawa	La couverture neigeuse de l'Unqava et des régions arctiques au moyen de la télédétection et des photoaériennes
Lawton,D.C. Geology & Geophys. Calgary	Development of the high resolution reflection seismic method
Lebel,J. Océanographie Québec-Rimouski	Hydrogéochimie des estuaires
Le Blond,P.H. Oceanography British Columbia	Ocean waves and coastal oceanography
Leclerc,A. Chimie Québec-Chicoutimi	Détermination des métaux en traces tels que Cd et As dans les sédiments du Fjord du Saguenay
LeDrew,E.F. Geography Waterloo	Significance of local heat sources on the dynamic climatology of the Beaufort Sea Region
Lee,D.R. Earth Sciences Waterloo	Groundwater contaminant-flux to surface waters
Lefebvre,G. Génie civil Sherbrooke	Etude du comportement des argiles structurées
Legault,J.A. Earth Sciences Waterloo	Lower Paleozoic Palynostratigraphy of Canada
Lenz,A.C. Geology Western Ontario	Paleontology, paleoecology, biostratigraphy and stratigraphy of lower paleozoic of Northern and Arctic Canada
Lerbekmo,J.F. Geology Alberta	Magnetostratigraphic, radiochemical and radiometric correlations near the Cretaceous - Tertiary boundry
Lespérance,P.J. Géologie Montréal	Biostratigraphie de l'Ordovicien Supérieur au Dévonien Inférieur du Québec
Levinson,A.A. Geology & Geophys. Calgary	Exploration and environmental geochemistry
Lewis,J.E. Geography McGill	Urban climate and land-cover: Surface energy exchange as a function of urban terrain characteristics
Lewkowicz,A.G. Geography Toronto	Measurement and simulation of permafrost degradation on slopes, Banks Island
Lewry,J.F. Geology Regina	Investigation of a possible lower Proterozoic fore-arc and collisional suture zone in northern Saskatchewan
Locat,J.E. Géologie Laval	Inter-relations entre la nature, les processus de formation des dépôts argileux et leur comportement mécanique
Logan,A. Geology New Brunswick	1) Interspecific aggression in Bermudian corals 2) Benthic hard substrate communities, Bay of Fundy
Long,B.F.N. INRS-Océanolog. Québec - INRS	Evolution sédimentologique et géomorphologique des estuaires de la côte nord du Golf du Saint-Laurent

Long,D.G.F. Geology Laurentian	Sedimentology and stratigraphy of Precambrian sequences
Longstaffe,F.J. Geology Alberta	Physico-chemical investigations of water-rock interaction in low-temperature environments
Louden,K.E. Oceanography Dalhousie	Earth structure
Luckman,B.H. Geography Western Ontario	Little ice age in Jasper National Park
Ludden,J.N. Géologie Montréal	Fine-scale evaluation of the petrogenesis and metallogenesis of igneous rocks from Archaean to recent terrains
Ludvigsen,R. Geology Toronto	Lower paleozoic trilobite biostratigraphy
Luk,S.H. Geography Toronto	Spatial variability of soil loss within small areas
Mackay,J.R. Geography British Columbia	Origin of permafrost and ground ice, Western Arctic Coast, Canada
Macko,S.A. Earth Sciences Memorial	Stable nitrogen isotope / chemical structure correlations in natural environments
MacLean,W.H. Geological Sciences McGill	Origin and mode of emplacement of Noranda-type massive sulfides at Matagami, Quebec
Macpherson,J.C. Geography Memorial	Palynological investigations, Newfoundland
Macqueen,R.W. Earth Sciences Waterloo	Carbonate-hosted lead-zinc deposits; sedimentology/Organic geochemistry of selected Canadian Paleozoic suites
MacRae,N.D. Geology Western Ontario	Geochemistry of crustal fusion processes
Mahaney,W.C. Geography York	Quaternary geology of Mount Kenya, East Africa
Malpas,J.G. Earth Sciences Memorial	1) Magma chamber processes in the oceanic and continental lithospheres 2) Volcanic stratigraphy of the western Avalon Peninsula
Mamet,B.L. Géologie Montréal	Microfaciès carbonatés du Paléozoïque; microfaune et microflore
Mandarino,J.A. Geology Toronto	Assessment of the compatibility of mineralogical data
Mansinha,L. Geophysics Western Ontario	Earth dynamics/Exploration geophysics
Martignole,J. Géologie Montréal	Recherches pétrologiques et structurales sur l'évolution de la province de Grenville
Martin,R.F. Geological Sciences McGill	Mineralogical and geochemical adjustments during rock-fluid interaction
Martini,I.P. Land Resource Sc Guelph	Quantitative studies of clastic sediments and rocks
Mathewes,R.W. Biolog. Sciences Simon Fraser	Late-quaternary vegetation and environmental changes in British Columbia
Mathews,W.H. Geological Sciences British Columbia	Cenozoic geology and geochronology, British Columbia
Mayer,L.A. Oceanography Dalhousie	High-resolution seismic stratigraphy
McCann,S.B. Geography McMaster	Morphology, sediments and dynamics of the shore zone
McCaughey,J.H. Geography Queen's	Energy and radiation balance studies
McGowan,C. Zoology Toronto	Phylogenetic relationships and functional anatomy within selected vertebrate groups, Recent and fossil
McGugan,A. Geology & Geophys. Calgary	1) Cretaceous micropaleontology 2) Pennsylvanian Permian stratigraphy 3) Recent foraminifera, West Coast, B.C.
McNutt,R.H. Geology McMaster	Radioactive isotope studies on Precambrian rocks
Meagher,E.P. Geological Sciences British Columbia	Chemical bonding and crystal chemical studies of minerals
Medioli,F.S. Geology Dalhousie	The camoebian and foraminiferal distributions in Eastern Canada. Techniques of study and applications to studies of Mplocene-Pleistocene paleoceanography and possibly biostratigraphy
Menzies,J. Geography Brock	Subglacial sedimentological environments
Mereu,R.F. Geophysics Western Ontario	Deep and shallow seismic sounding research
Miall,A.D. Geology Toronto	Analysis of fluvial depositional systems
Michel,F.A. Geology Carleton	Isotope investigations of northern groundwaters, permafrost and related phenomena
Middleton,G.V. Geology McMaster	Field and experimental studies of clastic sediments

Miller,H.G.
Earth Sciences
Memorial
Geophysical investigations of Newfoundland geology - onshore and offshore

Mitchell,R.H.
Geology
Lakehead
Petrology and geochemistry of kimberlites and alkaline rocks

Moon,W.
Earth Sciences
Manitoba
Theoretical geodynamics and seismology research

Moore,J.M.
Geology
Carleton
Evolution of the Grenvillian Orogen in Ontario

Moore,R.M.
Oceanography
Dalhousie
Trace element scavenging studies

Moore,T.R.
Geography
McGill
The biogeochemistry of northern peatlands

Morgan,A.V.
Earth Sciences
Waterloo
Paleoecology, zoogeography and paleontology of quaternary insects * with M.A.Morgan(Waterloo)

Morgan,C.
Geography
Guelph
Spatial and temporal variations of rainfall characteristics

Morgenstern,N.R.
Civil Engineering
Alberta
Geotechnical behaviour of permafrost, oil sands, and other natural materials

Mossman,D.J.
Geology
Mount Allison
Petrology, mineralogy and geochemistry of ore deposits

Mothersill,J.S.
Geology
Lakehead
Paleomagnetic studies of late Quaternary lacustrine and marine sedimentary sequences

Mountjoy,E.W.
Geological Sciences
McGill
Carbonate sedimentation and diagenesis Paleozoic and Holocene reefs and platform margins

Mucci,A.
Océanographie
Québec-Rimouski
Quantitative influence of phosphate on calcite precipitation from seawater

Muecke,G.K.
Geology
Dalhousie
Geochemical and isotopic studies of metamorphic and igneous rocks, minerals and ores with special emphasis on the evolution of the meguma zone, N.S. and eastern Canadian continental margin

Muehlenbachs,K.
Geology
Alberta
Stable isotope exchange studies and their application to geological problems

Murthy,G.
Earth Sciences
Memorial
Paleomagnetic and rock magnetic investigations of intrusive rocks from Labrador and from the island of Newfoundland and the study of implication of these results

Mysak,L.A.
Mathematics
British Columbia
Dynamical oceanography

Naldrett,A.J.
Geology
Field and experimental studies of Pt and Ni deposits and their host rocks

Narbonne,G.M.
Geological Sciences
Queen's
Trace fossils in lower paleozoic carbonates of Western Newfoundland

Nesbitt,B.E.
Geology
Alberta
Metamorphism and genesis of base metal sulfide deposits

Nesbitt,H.W.
Geology
Western Ontario
A comprehensive geochemical study of modern sedimentary basins

Nichol,I.
Geological Sciences
Queen's
Geochemical exploration in Canada

Nicholls,J.W.
Geology & Geophys.
Calgary
H2O contents of magmas, petrology of nephelinites and hawaiites

Nickling,W.G.
Geography
Guelph
Effects of surface and textural variables on the threshold velocity of sand in air

Nisbet,E.G.
Geological Sciences
Saskatchewan
Studies in Archaean Geology

Nkemdirim,L.C.
Geography
Calgary
Calgary's urban heat island

Noble,J.P.A.
Geology
New Brunswick
Faunal and sedimentary history of the north Appalachian Orogen, Silurian-Devonian

Norris,G.
Geology
Toronto
Biostratigraphy of Mesozoic-Cenozoic miospores and dinoflagellates

Nyland,E.
Physics
Alberta
Geodynamics of slow plate deformation at plate margins

Occhietti,S.
Géographie
Québec-Montréal
Stratigraphie & Paléoenvironnements quaternaires: Vallée et Golfe du St-Laurent

Oke,T.R.
Geography
British Columbia
Climate modification by urbanization

Oldenburg,D.W.
Geophys./Astron.
British Columbia
Inversion and inference of geophysical data

Oldershaw,A.E.
Geology & Geophys.
Calgary
Natural and induced diagenetic relationships in sedimentary rocks

Osborn,G.D.
Geology & Geophys.
Calgary
1) Holocene/late pleistocene glacial chronology and tephrostratigraphy 2) Dynamics of glacier bergschrunds

Page,P.
Sciences de la terre
Québec-Montréal
Géochimie des milieux glacio-aquatiques actuels et anciens de l'Est du Canada

Palmer,H.C.
Geophysics
Western Ontario
Paleomagnetism of late precambrian rock units

Papezik,V.S. Earth Sciences Memorial	Geology and industrial mineral deposits of volcanic rocks in the Avalon Zone of the Appalachian orogenic belt
Parslow,G.R. Geology Regina	1) U and associated elements - their geochemistry & relation to mineralization in W. Sask. 2) Base & Precious metals - their geochem. & relation to mineralization in Flin Flon volcanics
Pearce,G.W. Geology Toronto	Paleo-and rock magnetism of phanerozoic sedimentary deposits
Pearce,T.H. Geological Sciences Queen's	Petrology of Archean recent volcanics and applications of laser interference microscopy
Pe-Piper,G. Geology Saint Mary's	Geologic applications of mafic volcanic rock petrology and geochemistry
Perrault,G. Génie minéral Ecole Polytechnique	Recherche en métallogénie, minéraloqie et cristallographie
Peterson,R.C. Geology Queen's	Charge density analysis of mineral structures
Pickerill,R.K. Geology New Brunswick	Palaeontology, ichnology, sedimentology and stratigraphy of eastern Canada and other selected sequences
Platt,R.G. Geology Lakehead	Petrogenetic studies of alkaline and related rocks
Pond,G.S. Oceanography British Columbia	Inlet and coastal circulation, dynamics and mixing
Price,A.G. Geography Toronto	Runoff production and water quality in small hydrologic systems
Pride,C.R. Geology Ottawa	Rare earth element geochemistry of "granitic" and volcanic rocks
Quinlan,G.M. Earth Sciences Memorial	Thermo-mechanical models of Grand Banks sedimentary basins
Raeside,R.P. Geology Acadia	Metamorphism, deformation and plutonism, Cape Breton Highlands and Shelburne Metamorphic Complex, Nova Scotia
Ranalli,G. Geology Carleton	Role of rheology in geodynamics
Rankin,D. Physics Alberta	Magnetotellurics and micropulsations
Reardon,E.J. Earth Sciences Waterloo	Modelling water chemical evolution in the unsaturated and saturated zones/ion pair dissociation constants/silicate mineral dissolution kinetics
Rees,C.E. Geology & Chemistry McMaster	Studies in isotope geochemistry
Reeves,R.J. Geological Sciences Saskatchewan	Characterization of fractured rock masses
Reynolds,P.H. Physics/Geology Dalhousie	K-Ar, 40Ar/39Ar geochronology, paleomagnetism, oxygen isotopic studies
Rink,M.J. Geology McMaster	1) Palaeontology of Arctic bivalves 2) Biological destruction of reef frameworks
Riva,J. Geology Laval	Taxonomy and biostratigraphy of Ordovician and Lower Silurian graptolites
Rivers,C.J.S. Earth Sciences Memorial	Metamorphic and structural studies in the Grenville, Slave and Churchill provinces
Roberts,M.C. Geography Simon Fraser	The geomorphology and stratigraphy of the alluvial sediments of the lower Fraser River B.C.
Robin,P.Y.F. Geology Toronto	Rock deformation: mechanisms, and effects on fluid flow, metamorphic reactions and melting
Robinson,P.T. Geology Dalhousie	Petrology, structure and origin of the ocean crust
Rocheleau,M. Géologie Laval	Stratigraphie sédimentologie et géologie économique de la formation de Duparquet d'âge Archéen, Abitibi, Québec
Rochester,M.G. Earth Sciences Memorial	Theoretical global geophysics and planetary physics
Rodriques,C.G. Geology Windsor	Paleoecologic and stratigraphic significance of foraminiferida, ostracoda, and macrofossils from deposits in the Western Champlain sea basin
Roeder,P.L. Geological Sciences Queen's	Electron microprobe and experimental study of basaltic rocks
Rogerson,R.J. Earth Sciences Memorial	Cirque glaciers in Northern Labrador
Ross,J.V. Geology British Columbia	Structure and mechanical properties of silicate minerals: structural studies in central B.C.
Rouse,G.E. Botany British Columbia	Paleogene paleoclimates in southern and interior B.C.
Rouse,W.R. Geography McMaster	Energy and water balance studies in the low and high Arctic
Rousell,D.H. Geology Laurentian	Geology and mineralization of the Wanapitei complex, Ontario
Rowe,R.K. Civil Engineering Western Ontario	Geotechnical analysis and its implementation in design

Roy,A.G.
Géographie
Montréal
La géométrie des confluences de cours d'eau

Roy,D.W.
Sciences de la terre
Québec-Chicoutimi
Analyse structurale du socle dans la région du Haut-Saguenay, Québec

Rucklidge,J.C.
Geology
Toronto
Geological studies using ultra-sensitive and x-ray analysis

Rudd,J.W.M.
Biology
Winnipeg
* Refer to C.A.Kelly(Winnipeg)

Ruddick,B.R.
Oceanography
Dalhousie
The role of interleaving in ocean mixing

Russell,L.S.
Geology
Toronto
The Cretaceous-Tertiary transition in central Alberta

Russell,R.D.
Geophys./Astron.
British Columbia
1) Isotopic investigations 2) Geophysical instrumentation

Rust,B.R.
Geology
Ottawa
Studies of alluvial sedimentation in relation to coal deposits

Rutter,N.W.
Geology
Alberta
Amino acid dating techniques and Quaternary history of parts of Alberta, British Columbia, Yukon and Northwest Territories

Ryall,P.J.C.
Geology
Dalhousie
Magnetic properties of sea floor basalts and structure of mid-ocean ridges

Sarjeant,W.A.S.
Geological Sciences
Saskatchewan
Fossil dinoflagellate cysts and acritarchs; morphology, evolutionary relationships and application in palaeoecology and biostratigraphy

Saunderson,H.C.
Geography
Wilfrid Laurier
Flume experiments on stratification and hydraulic interpretation of eskers

Scarfe,C.M.
Geology
Alberta
Physical and chemical properties of silicate melts of geological interest

Schenk,P.E.
Geology
Dalhousie
Sedimentologic-stratigraphic studies of early through late paleozoic sedimentary rocks of Nova Scotia

Schloessin,H.H.
Geophysics
Western Ontario
Physical properties (mechanical, thermal, electrical, optical, magnetic) of matter under conditions of planetary interiors

Schreier,H.
Soil Science
British Columbia
Spectral reflection measurements to predict chemical soil and terrain conditions

Schroeder,J.
Géographie
Québec-Montréal
Les sediments detritiques et chimiques des grottes de gaspesie

Schwarcz,H.P.
Geology
McMaster
Isotopic geochemistry

Schwartz,F.W.
Geology
Alberta
Influence of porous medium structure on contaminant transport

Schwarz,E.J.
Mineral Eng.
Ecole Polytechnique
History of vertical movements of the Precambrian shield

Schwerdtner,W.M.
Geology
Toronto
Paleostrain analysis in the Canadian Shield

Scott,S.D.
Geology
Toronto
Geology and geochemistry of massive sulfide ores

Sequin,M.K.
Geology
Laval
Paleomagnetism of Quebec Archean greenstone, of Lower Paleozoic American and Baltic Vendian to Devonian rock sequences, and of Avalon microcontinent rock suites

Serodes,J.B.
Génie civil
Laval
Sédimentation intertidale et pouvoir auto-épurateur de l'estuaire du Saint-Laurent

Shaw,D.M.
Geology
McMaster
Geochemical studies of minerals and rocks

Shaw,J.
Geography
Queen's
Sedimentation by rivers and glaciers

Shaykewich,C.F.
Soil Science
Manitoba
Assessment of soil erosion due to rainfall in Manitoba

Shoemaker,E.M.
Mathematics
Simon Fraser
Glaciology

Siddiqui,Q.A.
Geology
Saint Mary's
Cenozoic ostracods from drillmites in the MacKenzie Delta and Beaufort Sea

Silverberg,N.
Oceanography
Québec-Rimouski
Sediment accumulation phenomena in the St. Lawrence Estuary

Silvestri,V.
Génie civil
Ecole Polytechnique
Résistance au cisaillement des argiles de l'est du Canada

Simony,P.S.
Geology
Calgary
Tectonics of the Rossland arc

Simpson,F.
Geology
Windsor
Cratonic-interior sedimentation and related tectonic controls

Sinclair,A.J.
Geological Sciences
British Columbia
Genetic models for gold deposits in the Canadian Cordillera

Singh,B.
Geography
Montréal
The ground thermal regime in the Hudson-James-Bay area, Nouveau-Quebec, as related to snow cover and energy exchanges at the surface

Sklash,M.G.
Geology
Windsor
Investigation of the role of groundwater in storm and snowmelt runoff

Slawson,W.F. Geophys./Astron. British Columbia	Earthquake recurrence rate: Beaufort-Cruickshank Fault, B.C.
Slaymaker,H.O. Geography British Columbia	Alpine and Arctic solute and sediment production, transport and yield
Smalley,I.J. Earth Sciences Waterloo	Mineralogy and properties of the sensitive clays of Eastern Canada
Smith,D.G. Geography Calgary	Sedimentology and deposition environments of the Athabasca-Peace river deltas
Smith,D.G.W. Geology Alberta	Applications of the microprobe in mineralogy, petrology, economic geology and meteoritics
Smith,J.L. Geological Sciences British Columbia	Transport processes in porous media
Smith,P.L. Geological Sciences British Columbia	Lower Jurassic biostratigraphy of North America and the geologic history of the northern Bowser basin
Smith,T.E. Geology Windsor	Tin mineralization and its association with peraluminous granitoid rocks in Nova Scotia and S.W. England
Saylie,D.E. Earth Sciences York	Dynamics of the earth
Sonnenfeld,P. Geology Windsor	Evaporite genesis
Soulie,M.F. Génie civil Ecole Polytechnique	Approche probabiliste en géotechnique
Spanos,T.J.T. Physics Alberta	The effect of the condensation of steam in heavy oil recovery processes
Spencer,R.J. Geology & Geophys. Calgary	Geochemical evolution of the western Canada sedimentary basin
Spooner,E.T.C. Geology Toronto	Geochemical and geological studies of hydrothermal ore deposits
Spratt,D.A. Geology & Geophys. Calgary	Deformation mechanics of thrust belts
Starkey,J. Geology Western Ontario	Textures and microstructures of deformed rocks and ores
Stauffer,M.R. Geological Sciences Saskatchewan	1) Structures in rocks 2) Exploration seismology in Precambrian Shield
Stearn,C.W. Geological Sciences McGill	Paleoecology of reefs
Stesky,R.M. Earth/Planet. Sci. Toronto	Geophysical properties of fractured and jointed rock
Stevens,R.K. Earth Sciences Memorial	Paleozoic evolution of West Newfoundland and adjacent areas
Steyn,D.G. Geography British Columbia	Sea breeze dynamics in the Lower Fraser Valley, B.C.
Stimpson,B. Mineral Eng. Alberta	Predicting size distribution of ore fragments in underground mining
St-Julien,P. Géologie Laval	Relations géométriques entre les structures mésoscopiques, macroscopiques et la tectonique globale du cambro-ordovicien des appalaches du Québec
Stockey,R.A. Botany Alberta	Tertiary vascular plants of Western Canada
St-Onge,D.A. Géographie Ottawa	Géologie du Quaternaire, Centre-nord du District du Mackenzie
Stranqway,D.W. Geology Toronto	Magnetic and electrical studies of geological significance
Stringer,P. Geology New Brunswick	Relation of cleavage to folding in the Appalachian - Caledonian orogenic belt
Strong,D.F. Geology Memorial	Crustal and metallogenic studies of regions bordering the North Atlantic
Stupavsky,M. Geology Windsor	Paleomagnetism of the Lorrain, Gordon Lake and Bar River formations of the Huronian Cobalt Group
Sundby,B. Oceanography Québec-Rimouski	Estuarine geochemical processes
Susak,N.J. Geology New Brunswick	Chemistry of hydrothermal solutions
Symons,D.T.A. Geology Windsor	Paleomagnetic studies: Cordillera and Phanerozoic Basins
Tassé,N. INRS-Géoress. Québec - INRS	Sédimentation et diagenèse en relation avec les minéralisations dans les basses-terres du Saint-Laurent
Taylor,C.H. Geography Trent	1) Effects of urban construction on runoff and water quality. 2) Variable source area delivery of pollutants. 3) Hydrology of the Peterborough region
Teller,J.T. Earth Sciences Manitoba	History of the nipigon basin link between east and west
Terasmae,J. Geological Sciences Brock	Deglaciation chronology of Ontario related to current ice sheet dynamics models

Thode, H.G.
Chemistry
McMaster
Mass spectrometric, nuclear and isotope chemistry studies

Thomas, R.G.
Geology
Calgary
Sedimentology and petrography of Upper Cretaceous sandstones, Southern Alberta

Thomson, S.
Civil Engineering
Alberta
Engineering characteristics and behaviour of stiff clay (till) and soft rocks and their application to engineering projects

Torrance, J.K.
Geography
Carleton
Rheology of Leda Clay - the influence of water content, salinity and amorphous materials

Trak, B.
Civil Engineering
Ottawa
1) Analytical study of the stability of slopes, embankments and excavations in Champlain clays 2) Thixotropic behaviour of remoulded clays, bentonite & bentonite-clay mixture

Trembath, L.T.
Geology
New Brunswick
Textural development in synthetic and natural systems

Trenhaile, A.S.
Geography
Windsor
The processes of coastal hard rock erosion

Trzcienski, W.E.
Géologie
Montréal
Petrology and tectonics of the Quebec Appalachians

Turek, A.
Geology
Windsor
Geochronological studies of the archean

Turnock, A.C.
Earth Sciences
Manitoba
Synthesis, crystal chemistry, and phase relations of silicates and oxides

Ulrych, T.J.
Geophys./Astron.
British Columbia
Time series analysis and inverse theory

Van de Poll, H.W.
Geology
New Brunswick
Role of liquefaction in the formation of sedimentary features

Vanicek, P.
Surveying Eng
New Brunswick
Geoid determination

Veizer, J.
Geology
Ottawa
Evolution of the terrestrial orogenic system

Vetter, W.J.
Eng./Applied Sci.
Memorial
Ocean sediment classification using acoustic sensing

Von Bitter, P.H.
Geology
Toronto
Carboniferous and permian conodont biostratigraphy and palaeoecology, Arctic Canada

Vreeken, W.J.
Geography
Queen's
Quaternary environments and paleosols in southern Alberta

Waldron, J.W.F.
Geology
Saint Mary's
Thrusting and mélange development, western Newfoundland Appalachians

Walker, R.G.
Geology
McMaster
Development of clastic facies models; emphasis on shallow marine systems

Wardlaw, N.C.
Geology & Geophys.
Calgary
Fluid flow in sedimentary rocks and oil and gas production

Warren, H.V.
Geological Sciences
British Columbia
Biogeochemistry as a ancillary tool in prospecting

Watkinson, D.H.
Geology
Carleton
Genesis of metallic mineral deposits

Watters, R.E.
Geology
Regina
Geochemical study of volcanic rocks in the La Ronge and Anisk Lake areas, Northern Saskatchewan

Waylen, P.R.
Geography
Saskatchewan
Stochastic analysis of floods on western and central Canada

Weaver, J.T.
Physics
Victoria
Electromagnetic induction in the earth and oceans

West, G.F.
Physics
Toronto
Applied, regional and tectono-geophysics

Westermann, G.E.G.
Geology
McMaster
Jurassic ammonites and cephalopod shells

Westgate, J.A.
Geology
Toronto
1) Stratigraphic applications of late Cenozoic volcanics in western North America 2) Quaternary geology and hydrogeology of the Newmarket region, Ontario

White, J.C.
Geology
New Brunswick
Electron microscopy studies of deformed rocks and minerals

Whitehead, N.E.
Geology
Laurentian
Distribution of Se, Te and As between hydrothermal and magmatic ores at Strathcona and Onaping Mines

Wicks, F.J.
Geology
Toronto
Crystal-chemical studies of serpentine minerals

Williams, H.
Earth Sciences
Memorial
Anatomy of the Appalachian-Caledonides Orogen and offshore extensions

Williams, M.R.
Geological Sciences
Brock
Analysis of part of the Britt Domain, Ontario Gneiss Segment, Grenville Province

Williams, P.F.
Geology
New Brunswick
Deformation mechanisms and tectonic processes

Williams-Jones, A.E.
Geological Sciences
McGill
The metallogeny of Cu, Mo, W and Sn in Gaspé and New Brunswick

Wilson, M.V.H.
Zoology
Alberta
Late Cretaceous and early Tertiary fishes of western North America

Woo, M.K. Geography McMaster	Snow and permafrost hydrology in a High Arctic environment
Woods, D.V. Geological Sciences Queen's	One-dimensional geomagnetic depth sounding in North America
Woussen, G. Sciences de la terre Québec-Chicoutimi	Etude des roches du Grenville dans le Haut-Saguenay
Wright, J.A. Earth Sciences Memorial	Geothermal and geomagnetic measurement on land and offshore in eastern Canada
Wright, S.K. Geography McGill	Seasonal variations in moisture storage in discontinuous permafrost
Yong, R.N. Civ Eng/App Mech McGill	Composition and control of fabric
York, D. Physics Toronto	Geochronology and isotope studies
Young, G.M. Geology Western Ontario	Study of some Proterozoic formations of the Great Lakes region
Zentilli, M. Geology Dalhousie	Metallogenic studies in Nova Scotia, the Andes and Iceland
Zodrow, E.L. Geology Cape Breton	Metal concentrations in coals of Sydney coalfield

A

Abell, P., 202
Abet, M.Y., 362
Achab, A., 579, 766, 767, 784
Adair, R.N., 799
Adshead, J.D., 637, 1024
Aftabi, A., 157
Agterberg, F.B., 263, 264
Ahmed, M., 592
Aitken, J.D., 1058, 1073
Allard, G.O., 1178
Alldrick, D.J., 4, 521, 522
Alt, B., 618
Amos, C.L., 967, 1025, 1026
Amyot, G., 1074
Anderson, A.J., 800
Anderson, D.L., 628
Anderson, G.M., 523
Anderson, J.C., 127
Anderson, N.L., 301
Anderson, T.W., 871
Andrew, A., 227
Andriashek, L.D., 631, 872, 873, 895, 903
Annor, A., 391
Ansdell, L., 182
Archibald, D.A., 228-232, 246, 265
Arjang, B., 602, 603
Armstrong, R.L., 6, 7, 11, 212, 227, 233-235, 248, 255, 257, 522, 1201
Arnold, R.G., 392
Ascoli, P., 1110
Ash, P.O., 363
Aspler, L., 982, 983
Asselin, E., 767
Aston, T.R.C., 393, 396, 396
Atkinson, J., 694
Aubertin, R., 693
Azzaria, L.M., 157, 421

B

Bachinski, D.J., 628, 801
Bachinski, S.W., 176, 801
Bachu, S., 631
Baig, M.W., 165
Bailes, A.H., 17
Baker, C.L., 899, 938
Baker, T.H.W., 382
Balakrishna, T.S., 906, 907
Ball, N.A., 652
Ballantyne, S.B., 203
Bamber, E.W., 682
Banerjee, I., 983
Baragar, W.R.A., 208, 802
Barlow, R.B., 282, 307
Barnes, C.R., 683-686
Barnes, M.A., 149
Barnes, W.C., 169, 1201
Barnett, D.E., 20, 958
Barnett, P.J., 874, 875, 968
Barr, S.M., 37, 803, 835, 838, 852
Barrett, T.J., 609, 523, 837, 1059, 1111
Barrow, P.S., 606, 1168
Barss, M.W., 768
Basinger, J.F., 769-771, 794
Batterson, M.J., 496, 959, 960
Bazinet, R., 156, 283-285, 297, 298, 300, 351
Beakhouse, G.P., 843
Beattie, E.T., 1128
Beaudoin, A., 526, 671
Beaumier, M., 158-160
Beck, A., 160
Bédard, J., 49, 362, 372, 804
Bedard, P., 536, 566
Béland, J., 53, 570, 580, 805
Bélanger, J.R., 805, 969
Bélanger, M., 62, 56
Béliveau, M., 772
Bell, R.T., 525
Bell, T., 961
Berard, J., 362, 372, 868
Berger, G.W., 269
Bergeron, M., 205
Bernier, L., 579
Bernier, P., 621
Bertrand, R., 150
Best, M.A., 986, 1015
Bétournay, M., 601
Beullac, R., 1202
Bigras, S.C., 127, 128
Binda, G., 616
Bird, G., 589
Biron, S., 63, 65, 66, 1106
Blackwell, B.A.L., 206
Blackwood, R.F., 21
Blake, W., Jr., 876
Blasco, S.M., 650, 877
Bobrowsky, P.T., 878
Boehner, R.C., 696, 986
Boisvert, D., 546, 607
Boivin, M., 156
Bolton, T.E., 687, 1075
Bonham-Carter, G.F., 265
Bonn, P., 912, 970-974
Bonyon, D.A., 1191
Borneuf, D.M., 622, 631
Bornhold, B.D., 1027
Bostock, H.H., 92, 93, 1195
Bouchard, M.A., 932
Boucher, M., 526, 527
Bourgeois, J., 618
Bourne, J.H., 806, 810
Bourque, P.-A., 1088
Bourque, Y., 555
Bower, M.E., 308
Bowman, W.A., 167
Bowring, S.A., 236, 258, 1157
Boyd, R., 719
Boyle, D.R., 161
Boyle, R.W., 207
Bozozuk, M., 608
Bragg, D.J., 698
Brand, U., 208
Brasnett, D., 330
Brassard, B., 528, 529
Bray, T., 765
Bredin, C., 725
Bridgwater, D., 58
Briggs, D.E.G., 1012
Bright, E.G., 113
Brisebois, D., 45, 1075, 1076, 1101, 1103
Brisson, L., 932
Brochu, R., 971, 974
Brookes, I.A., 879, 880
Brookfield, M.E., 911
Brougham, P., 985
Brown, A.C., 533, 538, 546, 608, 609
Brown, D., 605
Brown, R., 571
Brown, R.J., 286, 301, 536, 569
Brown, R.L., 233, 1135
Brown, T.H., 798
Bruce, W., 976, 978
Buchan, K.L., 309, 310, 317
Buchanan, P., 625
Buck, S., 1172
Buckley, D.E., 651
Burbidge, G.H., 986
Burden, E.T., 676
Burke, K.B.S., 176, 302, 1167
Burton, D.M., 530
Burwash, R.A., 237, 799
Buteau, P., 696
Butler, A.J., 162, 959

C

Cabri, L.J., 638, 639
Cain, P., 996-996
Cameron, A.R., 465-469
Cameron, B.E.B., 688, 690, 709
Cameron, B.W., 689, 773, 987, 1028
Cameron, E.M., 209
Campbell, F.H.A., 96, 1060
Campbell, I., 276
Campbell, K.S.W., 746
Campbell, R.B., 63, 1136
Cant, D.J., 988
Card, K.D., 116
Carey, J.A., 1061
Carlyle, L.W., 521
Carmichael, D.M., 231, 1140, 1167
Caron, A., 63
Carroll, R.L., 733-737, 748, 757-759
Carswell, A., 343
Carter, E.S., 690
Carter, M.W., 1195
Caselton, W., 628
Cecile, M.P., 1077
Cerny, P., 600, 661, 651, 655, 681, 800, 807, 825
Chackowsky, L.E., 662
Chagnon, A., 603-606, 609
Chagnon, J.Y., 911
Chainey, D., 931
Chamberlain, V.E., 238, 823, 824, 1182
Champagne, C., 122
Chan, A., 373
Chan, C., 165
Chandler, F.W., 989, 990, 1062
Chandra, J., 302
Charbonneau, B.W., 303
Charbonneau, J.-M., 46
Chartrand, F., 46, 609
Chase, R.L., 837
Chatterjee, A.K., 218, 610
Chauvin, L., 881
Cheadle, S.P., 335
Chen, T.T., 607, 608
Chernis, P., 359
Cherry, J.A., 620, 636
Cherry, M.E., 532
Chevé, S., 533
Chiarenzelli, J., 991
Chainière, J., 163, 168, 193
Chouteau, M., 283, 286
Christie, K.W., 511, 512
Christie, R.L., 697, 1078
Christopher, J.E., 1112
Chung, C.F., 259
Church, B.N., 330, 536, 611, 1197
Churcher, P., 366
Ciavaglia, L.A., 687
Ciesielski, A., 95, 120
Cimon, J., 42, 51, 52, 56, 493, 496, 505, 513, 520, 529, 535, 566, 555, 558
Clague, J.J., 882, 883
Clark, A.H., 232, 244, 245, 250, 319, 816, 869
Clark, G.S., 239, 240, 253
Clark, T., 42, 52, 529, 535, 566, 553, 558
Clarke, D.B., 218
Clément, P., 888
Clifford, P.M., 1161, 1166, 1198, 1199, 1207
Cloutier, M.A., 136
Cogulu, E., 612
Coleman, L.C., 819
Colman-Sadd, S.P., 22, 81
Colvine, A.C., 251, 532, 561, 606, 613, 623, 840, 1168
Colwell, J., 986
Coniglio, M., 1000
Connare, K.M., 241
Connelly, J.N., 1167
Cooke, D.G., 992, 1179
Cooper, B.J., 656
Copeland, M.J., 691
Corbett, C.R.R., 1137
Corfu, F., 243
Cormier, R.F., 242
Cousineau, P., 45
Couture, B., 165
Coyne, C.S., 787
Craig, L.C., 528
Crause, G.W., 1086
Crowe, A.S., 260
Cruden, D.M., 397
Culshaw, N.G., 85, 59
Cunningham, M., 823
Currie, K.L., 508, 509
Currie, P.J., 735, 1003
Currie, R.G., 513

D

Daigneault, R., 536, 1178, 1176
Dallmeyer, D.A., 1163
Dalrymple, R.W., 1023, 1029, 1032, 1039, 1051
Danis, D., 810
Danner, W.R., 1079
Darling, R., 165, 537, 542, 557, 558, 570, 580
Das, B., 398
Davenport, P.H., 162, 635, 960
David, P.P., 881
Davidson, A., 511, 512
Davies, E.H., 776, 775
Davis, D., 283
Dawson, P.M., 670
Dean, M.E., 582
Dean, P.L., 509, 616, 635
deBastiani, P., 776
DeBroucker, G., 46
Dechesne, R.G., 1138
Delair, J.B., 786
deRomer, H.S., 67
Desjardins, M., 576, 603, 649
desRivières, J., 538
Desrochers, A., 1080
Deutsch, E.R., 316
Devlin, J.E., 135
Dewez, V., 268, 271
Diakow, L.J., 566
Dickman, M., 136
Dickson, W.L., 81, 635
Dietrich, J.R., 983
DiLabio, R.N.W., 539
Dilcher, D.L., 770
Dilles, S.J., 1015
Dillistone, C., 344
Dillon, E.P., 606, 1168
Dillon-Leitch, H., 201
Dimroth, E., 1202
Dineley, D.L., 738
DiVergilio, M., 692
Dixon, J., 1115
Dixon, J.M., 28, 1139, 1140, 1167, 1175, 1183, 1193
Dixon, O.A., 693, 708, 713, 1008, 1097, 1099
Dodds, C.J., 5
Doggett, M.D., 629
Donaldson, J.A., 777, 952, 953, 991, 993, 998, 1009
D'Orsay, A.M., 1019
Downing, K.R., 995
Dredge, L.A., 884, 885
Dressler, B.O., 38, 115, 293, 564
Dubois, C., 48
Dubois, J.M.M., 121, 269, 270, 886-888, 979-973
Duckworth, K., 304
Duke, J.M., 560
Dunn, C.E., 166, 167, 996
Dunsmore, H.E., 961, 615
Dupuis-Hébert, L., 44
Dussault, C., 362
Dusseault, M.B., 365, 365-366, 576, 604, 562
Dwyer, M.K., 1129
Dyck, A.V., 287
Dyck, J.H., 129
Dyck, W., 210
Dyke, A.S., 889-892

E

Eade, K.E., 24
Easton, R.M., 38, 293
Eastwood, P., 330
Eberth, D., 1006
Eckstrand, O.R., 363
Eden, W.J., 405
Edlund, S.A., 778, 893
Edmund, A.G., 739-744, 750, 754
Edwards, W.A.D., 498-500
Egan, D.M., 650, 1036
Eggington, P.A., 130-132, 367
Eiche, G., 815
Eisbacher, G.H., 399, 1063
Ekstrand, O.R., 363
Elias, R.J., 698, 752, 755
Ellingham, E., 1006
Elliott, C., 1149
Ellwood, D.J., 211
El-Sabh, M., 970
Embry, A.F., 1116, 1151
Emory-Moore, M., 997
Enslie, R.F., 813, 816
Engi, M., 797, 966
Ercit, T.S., 661, 651
Erdman, L.R., 212
Erdmer, P., 82
Ermanovics, I.F., 81
Ernst, R., 559
Evans, B.W., 797
Evans, D., 552
Evans, D.J.A., 961
Evans, S.G., 968
Ewing, T.E., 1197
Eyles, C.H., 1007

F

Fabbri, A.G., 266
Fadaie, K., 359
Fadar, G., 720

Fahraeus, L.E., 684, 685, 695
Fahrig, W.F., 315, 316
Falls, R., 838, 859
Fang, C.-L., 329
Farquhar, R.M., 621
Farrar, E., 228–232, 244, 250, 319
Farvolden, R.N., 425, 435, 442, 445, 894
Fedikow, M.A.F., 168, 190
Fensome, R.A., 787
Fenton, M.M., 873, 895–897
Ferguson, R.B., 642, 652, 667
Ferguson, S.A., 36
Ferreira, R.J., 653
Ferri, F.F., 72
Fessenden, R.J., 1052
Fillion, G., 573
Finck, P.W., 953
Fischer, B.F.G., 1151
Fisher, D.A., 418
Fisekci, M.Y., 400
Fletcher, W.K., 175
Foley, P., 1019
Foley, S., 1159
Forbes, D.L., 271, 432, 1030
Ford, M.J., 898
Fordham, C., 365
Forest, G., 173
Forster, C., 426
Fortescue, J.A.C., 133, 134, 169, 170, 899
Foscolos, A.E., 171, 584, 585
Fossey, K., 397
Fowler, C.M.R., 829
Fox, J.C., 501
Fox, R.C., 745–747
Fralick, P.W., 1059
France, L., 245
Francis, D.M., 815, 826, 834
Franklin, J.M., 616, 617
Fraser, J.A., 96, 845
Frederking, R.M.W., 414
Freeze, R.A., 427, 428
French, H.M., 272, 278, 998
Friedman, R., 6
Friedrichsen, H., 1111
Frisch, T., 97, 98
Frith, R.A., 99–101
Fritz, W.H., 1081
Froese, E., 846, 847
Frydecky, I.I., 336
Fryer, B.J., 221, 807
Fuglem, M.O., 618
Fulton, R.J., 900–902
Fuzesy, L.M., 502
Fyfe, W.S., 119
Fyffe, L.R., 937

G

Gabert, G., 903
Gabrielse, H., 73, 74
Gadd, N.R., 369, 904
Gagne, R.M., 337
Gagnier, B.M., 981
Gagnon, R., 544
Gait, R.I., 654, 655
Gandhi, S.S., 585
Garcia, E., 816
Garvin, G., 427
Gaskill, P., 736
Gauthier, L., 49
Gauthier, M., 526–529, 546, 563, 567, 607
Geddes, R.S., 169, 898, 905, 906
Geldsetzer, H.H.J., 1082, 1083
Gemmell, D.E., 1017
Gerasimoff, M.D., 1139
Getsinger, J.S., 7
Geurts, M.A., 268, 273, 772, 776, 779, 780
Ghent, E.D., 868, 1138
Ghosh, D., 246
Gibbons, W., 622
Gibling, M., 984, 1015
Gibson, D.W., 1115, 1116
Gibson, H.L., 636
Gilbert, R., 274
Gilboy, C.F., 123
Giles, P.S., 495, 984
Gillham, R.W., 429
Gintautas, P.A., 180
Giovenazzo, D., 55, 656
Girard, P., 817
Giroux, G.H., 267
Glew, J., 274
Globensky, Y., 50
Godfrey, J.D., 67–70, 213, 331
Godfrey, S.J., 748
Godwin, C.I., 172, 175, 178, 227, 522, 626
Goff, S.P., 213
Goodarzi, F., 471, 472, 586
Goodfellow, W.D., 214, 215
Goodrich, L.E., 383, 386
Goodwin, M.J., 429, 430
Goodz, M., 994
Gordey, S.P., 125, 126
Gordon, T.M., 849, 850
Gorman, W.A., 135, 975
Gorzynski, G., 172
Gosselin, C., 575, 619, 644
Goulet, N., 544
Gower, C.F., 84, 851, 856
Gower, S., 324
Goyer, M., 173
Gradstein, F.M., 696–698, 718, 721
Grant, A.C., 587
Grant, D.R., 907–910
Grant, S.K., 657
Grasty, R.L., 305
Greenberg, D.A., 719
Greenhouse, J.G., 894
Greenhouse, J.P., 425
Greenlee, G.M., 1052
Greenwood, H.J., 7, 8, 798
Grice, R.H., 371
Grieve, D.A., 473
Grosovsky, B.D.D., 188
Gross, G.A., 547, 620
Gray, F., 780
Guliov, P., 503, 578
Gunter, W.D., 432
Gupta, V.K., 332
Gwyn, Q.H.J., 887, 888, 911, 912, 971–973
Gyenge, M., 401

H

Hacquebard, P.A., 474
Halabura, J., 594
Halden, N.M., 199, 216
Hale, W.E., 174, 548, 628, 997
Hall, J.M., 462
Hamilton, T.S., 338, 1200
Hamilton, W.N., 261, 504
Hankins, P., 411
Hanmer, S., 1152, 1167, 1169
Hann, B.J., 921
Hansen, B., 529
Harakal, J., 248
Harper, C.T., 58
Harris, D.C., 658
Harrison, R.S., 999, 1000, 1085, 1100, 1108
Hasan, M., 549
Haworth, R.T., 339
Hawthorne, F.C., 641, 651
Haynes, S.J., 197, 621, 1163, 1164
Heaman, L.M., 247
Heberlein, D.R., 175
Hébert, L.D., 546
Hébert, Y., 51, 55, 505
Hedjras, K., 859
Hedley, D.G.F., 402, 403
Heginbottom, J.A., 370, 384
Hein, F.J., 582, 657, 675
Helmstaedt, H., 869, 1139, 1173
Henderson, J.B., 25, 26, 28, 102
Henderson, J.R., 550, 1064, 1153
Henderson, P.J., 1031
Hendry, H.E. 202, 863, 865, 985, 1001, 1002, 1071
Herd, R.K., 18, 23
Héroux, Y., 150, 574
Hesse, F.R., 371
Hétu, B., 912
Hickson, C., 248
Hickson, I., 1201
Higgins, A.C., 699
Higgins, M.D., 219
Hildebrand, R.S., 1154
Hill, M.L., 257
Hillaire-Marcel, C., 930
Hiscott, R.N., 476
Hitchon, B., 431, 432
Hocq, M., 1065
Hodgson, D.A., 913, 914
Hodych, J.P., 317
Hoeve, J., 659, 862, 867
Hoffman, P.F., 27, 1066, 1155
Hogarth, D.D., 622, 818, 820
Hogg, A., 975
Holland, J.G., 246, 824
Hoogendoorn, E.L., 1032
Hooper, K., 700
Hora, Z.D., 506–508, 1197
Hornbrook, E.H.W., 176
Horodyski, R.J., 777
Horvath, V., 274
Houde, R., 868
Howie, R.D., 1084
Howitt, R.W., 1, 1053
Howse, A.F., 509
Hoy, T., 551
Hudson, B., 500
Huemmert, M., 447
Hughes, G.M., 424, 433
Hughes, J.D., 475
Hughes, O.L., 407, 915–917
Hugon, H., 1159
Hulbert, L.J., 819
Hunter, J.A., 340
Huntley, D.J., 249
Hwang, S.G., 1162
Hyde, R.S., 476

I

Imreh, L., 51, 1065, 1202
Ing, A., 1085
Irrinki, R.R., 1086
Irving, E., 1146
Isachsen, C.I., 234
Iwuagwu, J.F., 860

J

Jackson, G.D., 103, 104, 1067
Jackson, H.R., 453
Jackson, L.E., Jr., 136, 137, 918, 919
Jackson, M.C., 39
Jackson, V., 34, 35
Jacob, H.L., 493, 496, 505, 513, 520
Jambor, J.L., 660–662
Jameison, H., 672
James, D.T., 28
James, N.P., 1080
Jansa, L.F., 1033, 1117
Jansser, B., 830
Jenner, G.A., 221
Jerzykiewicz, T., 477
Jha, K., 601
Johns, G.W., 116
Johnson, H.P., 1204
Johnson, M.D., 603
Johnson, P.G., 275–277, 280, 281, 416, 417
Johnston, D., 685
Johnston, G.H., 383, 385, 386
Jonasson, I.R., 131, 177
Jones, J.R., 987, 1028
Josenhans, H.W., 454
Jourdain, V., 1177
Journeay, J.M., 231, 233, 1140
Juras, S., 178

K

Kalkreuth, W.D., 478–481, 588
Kaplan, J.E., 8
Karrow, P.F., 425, 894, 920–923
Kaszycki, C.A., 924
Katsube, T.J., 352
Kayumbu, R.M., 1002
Kean, B.F., 552
Keen, C.E., 341, 353
Keller, C.K., 434
Kelly, D., 579
Kenna, K., 685
Kennedy, D.J., 701
Kennedy, J.E., 786
Kent, T., 417
Keppie, J.D., 197, 621, 1163, 1164
Kerans, C., 993
Kern, J., 1056
Kerr-Lawson, L., 921
Kheang, L., 553
Kilby, W.E., 482, 483
Killeen, P.G., 354
Kim, C., 371
King, L.H., 1184
Kirby, F.T., 510
Kirk, J.S., 589
Kirkham, R.V., 554
Kish, L., 555
Klassen, r.A., 925–928
Klassen, R.W., 64, 556
Knapp, C.J., 702
Knappers, W.A., 318
Knight, I., 179, 1087
Knight, J., 179
Kodybka, R.J., 276, 277
Koerner, R.M., 418
Koke, K., 725
Konan, G., 372
Kontak, D.J., 250
Koo, J., 484, 485
Korstgaard, J., 88
Koster, E.H., 1003
Kovac, L.J., 590, 1005
Kramer, J.R., 225
Kramers, J.W., 1004
Krebes, E.S., 342
Krogh, T.E., 243, 1163
Kubler, B., 150, 643
Kucera, R.E., 423
Kukalova-Peck, J., 703
Kupsch, W.O., 755
Kurfurst, P.J., 387
Kyser, T.K., 819, 831

L

Lachambre, G., 1088
Lachance, G.R., 146
Lacoste, P., 55, 1202
Lacroix, R., 559
Lacroix, S., 557, 558
Laflamme, J.H.G., 638, 639
Lafleur, J., 820
Lamarche, R., 546
Lambert, M.B., 821, 822
Lambert, R.St.J., 238, 246, 254, 823, 824, 1182, 1185, 1187
Lamothe, D., 52, 55
Lane, L., 233
Langenberg, C.W., 69, 70, 331, 1130
Langlais, L., 173
Langley, K., 418
Langridge, R., 319
Lapointe, M.F., 138
Laporte, P.J., 29
Larrson, S.Y., 1089
Lasalle, P., 929
Last, W.M., 139, 140, 149, 590–592, 594, 650, 930, 935, 1005, 1034, 1035, 1045, 1046
Laurent, R., 805
Lauriol, B., 912
Lauzière, K., 55
Lavergne, G., 122
Lavigne, M.J., 623
Law, K.T., 408
Lawton, D.C., 335, 347, 350
LeCheminent, A.N., 105, 106, 991
LeChiminant, G., 1205
Lee, D.N.H., 663
Leech, G.B., 1141
Lefebvre, D.L., 160, 288–297, 320, 321, 355, 356
Legault, J., 284, 298
Leggett, J.K., 1111
Legun, A., 483
Lemoine, R.M.J., 1035
Leonardi, G., 717
Lerbekmo, J.F., 322, 860
Lespérance, P.J., 692, 1103
Lessard, G., 270, 911
Levinson, A.A., 180
Levson, V.M., 931
Lewis, C.F.M., 455
Lichti-Federovich, S., 781
Liu, Y-H., 738
Locat, J., 511
Lockhart, E.B., 1034
Loeffler, E.J., 738
Loftsson, M., 404
Logan, A., 456, 457
Longstaffe, F.J., 181, 182, 233, 260, 582, 589, 657, 663, 664, 669, 675, 807
Loop, J., 818
Lotimer, A.R., 435
Lourim, J., 169, 170

Ludden, J., 842
Ludden, J.N., 570, 815
Lugowski, J., 523
Luternauer, J.L., 1036, 1037
Lydon, J.W., 560
Lytviak, A.T., 431, 432

M

Maathuis, H., 436, 444, 944
Macdonald, A.J., 623-625
MacDonald, A.S., 803
Macdonald, D.E., 512
Macdonald, M.A., 195
MacDonald, P., 402
Macdonald, R., 58-60
MacDougall, D., 629
MacEachern, I.A., 953
Macek, J., 642
MacGillivray, J.R., 261
MacInnis, I., 349
MacIntyre, D.G., 9
Macker, D., 1056
Mackie, G., 922
Mackintosh, A.D., 189
MacLean, B., 458
MacMillan, R.A., 2
Macnab, R.F., 306
MacPhee, J.A., 487
Macyk, T.M., 141
Madden, C.T., 749
Mah, A., 459
Mahnic, P., 956
Mailath, S., 1185
Mainwaring, P.R., 665
Makila, A., 531
Malo, M., 33
Malpas, J., 462
Mannard, G., 89
Marchand, K., 1176
Marmont, S., 251, 561
Marsh, P., 437, 438
Martel, A.T., 593
Martineau, G., 932
Martineau, Y., 88
Martini, I.P., 911
Mase, C.W., 1186
Masoumzadeh, S., 397
Massey, N.W.D., 40
Massman, J., 428
Masson, A.G., 1015
Mathews, W.H., 252, 1201
Matthews, J.V., Jr., 704
Maurel, L.E., 1131
Maurice, Y.T., 183, 184
Mayr, U., 1090
McAllister, A.L., 530, 628
McAndrews, J.H., 879, 880
McAuley, R.J., 705
McCabe, P.J., 486
McCann, J., 666
McClung, D.M., 415
McConnell, J.W., 185, 186, 960
McCulloch-Smith, L.A., 592, 594
McCutcheon, S.R., 1054, 1091
McDonald, B., 626
McDonald, H.G., 750
McDonough, M.R., 1142
McEwen, J. 201
McGlynn, J.C., 323
McGregor, C.R., 667
McGregor, D.C., 782
McGugan, A., 706
McIntyre, D.J., 783
McKenna, F.P., 439
McKenna Neuman, C., 274
McKenzie, C., 129
McKenzie, F.B., 440
McLaren, P., 1038
McMechan, M.E., 10, 1061
McMillan, N.J., 595-597
McMillan, W.J., 4, 484, 485, 521, 562
McMurtry, G., 449
McNeil, D.H., 707
McNutt, R.H., 217, 241, 247
McPhail, D.C., 798
McTaggart, K.C., 7
Meagher, E.P., 798
Medioli, F., 718-721
Mehrotra, N.C., 787
Meijer-Drees, N.C., 1092
Meintzer, R.E., 825
Mellinger, M., 187, 862
Mercier, A., 933
Merriam, J.B., 360
Meyer, J.R., 614
Miall, A.D., 1006, 1007, 1126
Michel, F.A., 388, 441, 994
Michoux, D., 784
Middleton, G.V., 1013
Miller, A.L., 991
Miller, A.R., 627
Miller, B.B., 922
Miller, H.G., 333, 476
Mirkovich, V., 391
Moell, C., 897
Mohan, K.V., 628
Monger, J.W.H., 75
Montgomery, D.S., 664
Moon, W., 343, 344, 357
Moore, R.G., 36, 1105
Moran, S., 366
Moravec, A., 359
Morgenstern, N.R., 373, 378, 379, 413
Morin, D., 971
Morin, G., 563
Morin, R., 645
Morrison, J.O., 208
Morrow, D.W., 30, 1093
Morton, R.D., 512
Mossman, D.J., 188, 189, 629, 668, 751
Mossop, G.D., 988
Mott, R.J., 785
Mougeot, C., 896
Mraz, D., 365
Mudie, P.J., 720, 934
Muecke, G.K., 218, 610, 1163
Mugridge, S., 861
Muir, I.D., 1008
Munro, I., 708
Murthy, G., 324
Mussakowski, R., 978
Mustard, P., 994
Mwenifumbo, C.J., 358

N

Nadeau, S.N., 826
Nagy, B., 188
Naldrett, D.N., 998
Nandi, B.N., 487
Nantel, S., 513
Nassichuk, W.W., 1094
Nauss, A.L., 709
Neale, K.L., 1009
Nelson, E.B., 669
Nesbitt, B.E., 182
Newbury, R., 1035
Nicholls, J., 827
Nielsen, E., 190, 955
Nikiforuk, W.L., 1057
Nisbet, E.G., 828-832
Noble, J.P.A., 715, 861, 1010
Noel, N., 85
Norford, B.S., 702, 1095
Norris, A.W., 710, 1096
Norris, D.K., 65, 1180
Nowlan, G.S., 708, 711, 767
Nunn, G.A.G., 85, 89
Nurkowski, J.R., 488
Nutman, A., 88
Nyland, E., 345

O

O'Brien, B.H., 197, 621, 1163, 1164
O'Brien, S.J., 87
Okulitch, A.V., 76, 1156
Ollerenshaw, N.C., 3, 1143
Olson, D.G., 325
Orchard, M.J., 712
O'Reilly, G.A., 197, 218
Ortiz, T., 460
Osadetz, K.G., 1151
Osborn, G.D., 419, 935
Ottaway, T., 670
Otto, J.E., 1039
Overton, A., 346
Owen, J., 851
Owusu, J., 343
Ozoray, J., 859

P

Packard, J.J., 1097
Padgham, W.A., 34, 35, 236, 1072, 1157
Pageau, Y.N., 757
Pal, B.K., 476
Palmer, J.H.L., 381
Panteleyev, A., 564
Parameswaran, V.R., 389
Parent, M., 888
Parkins, W.G., 713
Parkinson, D.L., 11
Parnandi, M., 418
Parrish, R.R., 233, 257
Pate, C., 1187
Patel, I., 1019
Paterson, D.F., 1011, 1022
Patton, E.P., 428
Patzold, R.R., 317
Pawling, A., 1055
Pawlowicz, J., 897
Pearce, T.H., 816, 833, 869
Pearson, J., 565
Peavey, S., 476
Pedder, A.E.H., 1098
Pehme, P., 425, 894
Pelletier, B.R., 936, 1040
Pelletier, M., 191-193
Pemberton, S.G., 714
Penner, E., 383, 409
Penner, L.A., 410
Perrault, G., 194, 529, 531, 536, 559, 566, 573, 636, 666, 671
Perreault, S., 122
Pesant, A., 974
Peterson, R.C., 672
Petrie, J.M., 442
Petruk, W., 673
Petryk, A.A., 34, 692, 979, 1080
Picard, C., 44
Pickerill, R.K., 1012
Pillet, D., 42
Piper, D.J.W., 461, 1041
Pitcher, D.H., 282
Plant, A.G., 674
Plante, L., 567
Plint, A.G., 1012
Poey, J-L., 1099
Pohler, S., 685
Poirier, M.A., 601
Poley, D.F., 347
Pollard, W.H., 272, 278
Poole, W.H., 635
Pope, C.S., 715
Poulton, T.P., 1118
Powell, T.G., 152
Power, J.M., 420
Price, L.L., 1119
Price, R.A., 12
Prichonnet, G., 932
Pride, C., 818
Pride, N.J., 253
Prime, G., 984
Pringle, G., 668
Procter, R.M., 598
Procyshyn, E., 1175
Pronk, A.G., 937, 1054
Provencher, L., 279
Prowse, T.D., 142
Prudhomme, S., 546
Pryer, L.L., 1161
Pugh, D.C., 107
Purdy, D., 1100

Q

Qayyum, A.M., 599
Quarch, H., 1165
Quirt, D.H., 862

R

Raeside, R.P., 37, 852
Raicar, M., 600
Rainbird, R., 994
Ramik, R., 680
Ranalli, G., 359
Rashid, M.A., 1042
Raudsepp, M., 678
Ravenhurst, C.D., 568
Rawsthorn, K., 863
Ray, G.E., 13, 14
Ready, E.E., 326
Reesor, J.E., 77
Reeves, M.J., 392, 405, 410, 599
Reid, I., 348
Relf, C., 35
Renault, R.W., 1043
Reynolds, P.H., 568
Rhéault, M., 1101
Rice, M.C., 1166
Rice, R.J., 1013
Richard, J.A., 938
Richard, S.H., 939, 940
Richards, B.C., 1102
Richardson, R.J.H., 514
Ricketts, B.D., 489
Ricketts, M.J., 515
Riddle, C., 145, 148
Riggert, V.L., 1132
Riley, J.L., 516
Riosa, J.A., 753
Riva, J.F., 716
Rivard, B.R., 834
Rivers, T., 851, 853, 856
Robb, G.A., 675
Robertson, A.H., 1111
Robin, P.Y.-F., 1170
Robinson, H.P., 1205
Robinson, P.T., 662
Rochester, M.G., 360
Rochon, G., 973
Roddick, J.A., 78
Rodriques, E., 143
Roeder, P.L., 869
Rogers, H.D., 835, 852, 987
Rogers, P.J., 195
Rogerson, R.J., 941
Root, K.G., 1068
Roscoe, S.M., 569
Ross, G., 993
Ross, J.V., 7
Ross, L., 425, 894
Rottenfusser, B.A., 1014
Rouillard, M., 1103
Rouse, G., 709
Rowell, N.F., 41
Roy, C., 570, 1069
Roy, D.W., 122, 1176, 1177
Royer, A., 971
Ruitenberg, A.A., 630, 1054, 1091
Russell, D.J., 379, 603
Rust, B.R., 984, 986, 994, 998, 1015, 1016, 1031
Rutherford, G.K., 1055, 1056
Rutter, N.W., 206, 873, 878, 931, 954
Ruzicka, V., 571
Ryan, B., 88, 91
Ryan, R.J., 1012

D

Sabourin, R.G., 147
Sado, E.V., 942
Sage, R.P., 117, 118, 631
St-Julien, P., 43, 45, 46
St. Onge, D.A., 943
St-Onge, M.R., 1158
St. Peter, C.J., 1017
Salas, C.J., 1016
Sanford, B.V., 1104
Sangster, D.F., 372, 632
Santos, R.R., 349
Sarjeant, W.A.S., 717, 786, 787
Sassano, G.P., 646
Sauveplane, C.M., 431, 432
Savoie, A., 573
Sawatzky, H., 601
Sawatzky, P., 327
Sawyer, E.W., 1170
Sayed, M., 414
Schaerer, P.A., 415
Schafer, C.T., 463, 720, 1044
Schaffer, C., 997
Schandl, E.S., 834
Schau, M., 108, 836
Scheckler, S.E., 771
Schoff, D., 718
Schreiner, B.T., 124, 944, 950
Schrijver, K., 196, 574, 646
Schroeder, C., 718
Schroeter, T.G., 564
Schulz, T.M., 411
Schwann, P., 61
Schwartzburg, R., 280, 417
Schwarz, E.J., 328, 361
Schwerdtner, W.M., 1159, 1188
Schweyen, T.H., 1034, 1045
Scoates, R.F.J., 239
Scott, B.P., 60
Scott, D.B., 719-721, 879, 880
Scott, D.J., 411
Scott, J.D., 366, 376
Scott, K.L., 257
Scott, S.D., 449, 837

Seal, R., 232
Seaman, A.A., 20
Sego, D.C., 377-379, 411
Senior, S., 404
Seuthé, C., 979-981
Sexton, A.J., 838
Seymour, K.L., 734
Shakur, A.S., 447
Shau, P., 517, 518
Sharma, J., 787
Sharma, K.N.M., 55
Sharpe, D.R., 945
Shaw, D.M., 203, 219, 220, 247
Shetsen, I., 946
Shilts, W.H., 144, 947-949
Sibbald, T.I.I., 61
Sibul, U., 143, 430, 439
Simard, A.S., 1069
Simard, M., 575
Simony, P.S., 72, 1061, 1068, 1137, 1138, 1142, 1151
Simpson, M.A., 950
Sinclair, A.J., 267, 322, 633
Sinclair, W.D., 576
Singh, C., 788-790
Singhroy, V.R., 968, 976
Sinha, A.K., 299
Sinha, N.K., 414
Sinthusan, A., 1105
Sketchly, D., 633
Skibo, D.N., 602
Skidmore, W.B., 48, 49, 53, 1088
Skwara, K., 755
Slam, B., 721
Slaney, V.R., 977
Slezak, L.A., 1038, 1046
Slivitzky, A., 1106
Smith, A., 254
Smith, G.G., 490
Smith, J.L., 426, 448, 1186
Smith, J.W.J., 187
Smith, L.S., 428
Smith, P.K., 197, 621, 1163, 1164
Smith, P.L., 690, 709, 722, 726
Smith, R., 281
Snowdon, L.R., 153-155
Soderberg, H., 366, 376
Solberg, T.N., 818
Soles, J.A., 519, 839
Soloman, S., 476
Sommer, M., 621
Souther, J.G., 248, 634, 1189, 1201
Sparkes, B.G., 951
Spratt, D.A., 1128, 1129, 1131-1134, 1151
Sprenke, K.F., 331
Springer, J.S., 606, 676, 976, 978, 1168
Srivastava, S.P., 1190
Stalker, A.MacS., 952
Starr, J., 601
Stea, R.R., 953
Stearn, C.W., 459, 460, 723, 724, 1089
Steele, K.G., 954
Steger, H.F., 147
Stein, R., 443
Steick, C.R., 725
Stepic, J.M., 955
Stevens, G.R., 1162, 1163, 1191
Stevens, K., 1178
Stewart, R.B., 1056
Stonley, G., 747
Storer, J.E., 749, 756
Stott, D.F., 1120, 1121
Stout, M.Z., 827, 848
Stringer, P., 1147, 1192
Strong, D.F., 221, 610, 635
Struik, L.C., 1122, 1139
Stuart, N.J., 380
Sues, H.-D., 757
Sun, M., 255
Sutcliffe, R.H., 119
Svec, O.J., 381
Swan, G., 403
Sweet, A.R., 791, 792
Swinden, H.S., 221
Sykora, J., 605
Syme, E.C., 17
Syvitski, J.P.M., 1047, 1048
Szymanski, J.T., 677

T

Talkington, R., 636
Tammemaji, H., 807
Taner, M., 194
Tang, R., 357
Tanguay, M., 979-981
Tassé, N., 574, 1018
Taylor, F.C., 31
Taylor, G.C., 1144
Taylor, P., 449
Taylor, R.B., 390, 460, 1049
Telford, P.G., 491, 603
Tella, S., 32, 109, 110
Teller, J.T., 956
Templeman-Kluit, D.J., 15, 1123, 1181
Terasmae, J., 134, 957
Teskey, D.J., 262
Theyer, P., 198, 870
Thibault, J.J., 958
Thomas, A., 89
Thomas, D.J., 62
Thomas, K., 601
Thomas, M., 59
Thompson, P.H., 111
Thompson, R.C., 726
Thompson, R.I., 66, 1107, 1145
Thomson, J., 1161
Thomson, S., 411-413
Thorpe, R.I., 222, 577
Thorsteinsson, R., 33
Thurston, P.C., 39, 116, 1196
Tiedemann, C., 412
Tilkov, M., 267
Tilley, B.J., 223
Tipper, H.W., 726, 1124
Toews, N.A., 406
Torrance, J.G., 1139
Tozer, E.T., 727
Treagus, J.E., 1192
Tremblay, A., 520
Tremblay, L., 1171
Trettin, H.P., 112
Trottier, J., 346
Trowell, N.F., 117, 118, 631
Troyer, D.R., 578
Trudel, P., 136, 194, 285, 297, 366
Truscott, M.G., 220, 224
Trzcienski, W., 533
Tsikos, G., 1193
Tsui, P.C., 413
Tuach, J., 635
Turchenek, L.W., 71
Turnock, A.C., 678, 855

U

Unrau, J. 365
Utting, J., 793
Uyeno, T.T., 728

V

Valade, M., 355
Valiquette, G., 579
Vallée, M., 300
van Berkel, J.T., 1139
van Breemen, O., 256
van de Poll, H.W., 997, 1012, 1019
van der Heyden, P., 233, 235, 257
van der Kamp, G., 434, 436, 444
Van der Leeden, J., 56
van der Pluijm, B.A., 1130
Van derveer, D.G., 510, 515, 951, 959, 960
Vander Voet, A., 148
van Everdingen, D.A., 445
van Groenewoud, H., 1054
van Kranendonk, M., 1159
van Loom, G.W., 1055, 1056
Van Nostrand, T., 856
Van Schmus, W.R., 258
van Staal, C.R., 1148
Van Wagoner, N.A., 1203-1206
Van Wagoner, S.L., 1206
Varsek, J.L., 350
Veillette, J.J., 57
Vilks, G., 720, 729, 1020, 1050
Vilks, P., 225
Vincent, E.E., 794
Vincent, J.-S., 961-963
Vos, M.A., 840
Vu, L., 580

W

Wade, J.A., 1125
Wadien, R., 199
Wagner, P.A., 237
Waheed, A., 1007
Waldron, J.W.F., 1163
Walker, D., 1108
Walker, R.G., 995
Wall, D.A., 787
Wall, J.H., 730, 731
Wallace, H., 1070
Wallick, E.I., 432, 446, 447
Walsh, D.M., 758
Walter, R.C., 964, 966
Wan, Pu., 859
Wardle, R.J., 90, 91
Wares, R., 581
Warren, H.V., 200, 226
Watkinson, D.H., 201, 636, 841, 994
Watson, S., 686
Watts, S.H., 965
Webby, B.D., 686
Weber, W., 240
Wells, R.E., 1057
Wellstead, C.F., 759
Westgate, J.A., 964, 966
Westinbrink, G., 1056
Wheatley, K., 202, 1071
Wheeler, J.O., 79
Wheeler, J.W., 787
Whelan, G., 89
White, J.C., 1171
Whittaker, P.J., 841
Wicks, F.J., 670, 679, 680, 854, 857-859
Wightman, D.M., 1021
Wighton, D.C., 732
Wild, R., 737
Wilks, M., 832
William-Jones, A., 581, 1178
Williams, G.K., 1160
Williams, G.L., 604
Williams, H., 1109
Williams, H.R., 1172
Williams, P.F., 1148-1150, 1194
Wilson, B., 994
Wilson, B.C., 1173
Wilson, C., 842
Wilson, J.A., 864
Wilson, M.A., 1022
Wilson, M.V.H., 732, 760-764
Wing, S.J.C., 865
Wise, M.A., 641, 681
Wittebolle, R.J., 379
Wolf, R.R., 1023
Wood, D., 89
Wood, J., 243, 613
Woodbury, A.D., 448
Woodsworth, G.J., 16, 80, 257
Wright, J.A., 329, 476

Y

Yeh, H.-W., 449
Yeo, G.M., 34, 35, 1072
Yole, R.W., 605, 1146
Yorath, C.J., 1127
Young, G.M., 1072
Youzwyshyn, G., 747
Yu, Y.S., 406

Z

Zaitlin, B.A., 1051
Zavnscherb, E., 1207
Zentilli, M., 549, 568
Zilans, A., 923
Zinter, G., 366
Zodrow, E.L., 492, 765, 795, 796
Zwanzig, H.V., 19

POOR

QUALITY

ORIGINAL